

Final Performance Report
Specialty Crop Block Grant Agreement 12-25-B-0948

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Project Title: Feasibility Study of a SC Store at the SC State Farmers Market

Sub-Recipient: SC Farm Bureau

Project Summary:

With the opening of our new South Carolina State Farmers Market in fall 2010, the ongoing success of the South Carolina Department of Agriculture's Certified SC Grown Program, coupled with the interest in locally grown produce, an additional avenue to bolster local sales for SC producers could be to operate a Certified SC Store. Our project was to study the feasibility of this plan.

A Certified SC Store would offer access to an additional market for continued success of Certified SC members. It would offer opportunity for consumers to frequent the State Farmers Market and buy branded Certified SC products in a branded Certified SC marketplace.

The application to be registered as a Certified SC member is very good in establishing requirements and standards for the program. Successful establishment of the Certified SC Store would involve cooperation from throughout the state's agricultural industry. Product quality standards would need to be adhered to for the variety of Certified SC products sold. The diversity of specialty crops grown in our state could be displayed in prominent and proud fashions that would generate interest and increase sales.

Project Approach:

The retail buildings that are scheduled for the State Farmers Market are known as "The Stables". This section of the market offers a perfect storefront from which the Certified SC Store could be operated.

Our means of gathering data for the project included:

1) Personal interviews and discussion forums with producers and retailers involved in Certified SC Program, Goodness Grows NC Program and AgriMissouri Program Missouri. These discussions were led by staff members of the SC Farm Bureau.

2) Survey of SC producers

Survey results were not satisfying for the reason that we did not receive an adequate number of responses back from participants. The survey was re-issued, but again with a low number of results.

The responses from the discussions made and the limited number of surveys that were received, revealed these answers that are presented in the following lists, which the SC Farm Bureau staff interpreted as assessments:

CERTIFIED SC STORE CHALLENGES

- Multi stakeholders
- Normal production concerns weather, timing of planting and harvesting, yield
- Changes in local supply and demand.
- Increased community Farmers Markets and CSAs may mean fewer customers
- Proximity of Certified SC Store on State Farmers Market to local farm sale sheds
- Proximity of Certified SC Store to participating SC farms already at the Market
- Products from many sources offer challenges for uniformity and quality control.
- Food Safety/ traceability
- Funding – Initial and sustaining

CERTIFIED SC STORE STRATEGIES FOR SUCCESS

- Multi stakeholders
- Would allow producers to defray costs of locating their own market space
- Would operate a niche market for consumers
- Niche market would offer opportunity for smaller local producers
- A variety of products could be offered in a unique way
- Expand and diversify market opportunities and increase demand
- Target consumers who want to purchase Certified SC
- A large range of Certified SC products to sell offers greater probability to succeed
- Economic impact of “buying local”

The wave of interest in local grown is high and many stake holders see opportunity in this type of Certified SC Grown Store. We found the actual fundamentals for operation would prove to be a hurdle for success. This setup would benefit small farmers and producers who cannot maintain a market site away from their operation but could detract from SC producers who operate in the SC State Farmers Market sheds.

Survey results found that funding will be a hurdle encompassing rent, operations, salary, expenses versus income into the operation. Assessments per sale would be the choice of income among producers. Polling also showed that internet sales could offer another vantage point for income into the Certified SC Store but would need development and require initial start-up expenses.

Goals and Outcomes Achieved:

This Feasibility Study for Certified SC Store located on SC State Farmers Market concludes that at this time the operation of the business may not be profitable or worthy of initiation. Therefore, no design work for the actual footprint or layout of a store was made.

Beneficiaries:

None.

Lessons Learned:

There is a huge amount of difficulty in having producers participate in a survey study. The main difficulty was having the producers actually take the time to fill out the survey. Many of the producers procrastinated, or apologized, saying that they meant to do it, but simply forgot. Most of the producers did not see any value in participating in a Certified SC Store because they wanted to pursue independent avenues of marketing and individual retail sales, instead of acting together as a co-op.

If another feasibility study were to be undertaken that involved polling small producers, it is advisable to illustrate how the long range goal would be beneficial to them. Showing other success stories of co-ops or state funded facilities or markets may entice the producers to participate.

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Project Two: SC Agribusiness Economic Development through CASGA
Sub-recipient: Carolina AgriSolutions Growers Association (CASGA)
FINAL REPORT

Project Summary

The purpose of this initiative was to enhance the specialty crop (muscadine) sector and related value added horticultural industries in South Carolina through the organization of existing growers and industry leaders into a business organization known as the National Muscadine Board. Additional project objectives included outreach related to the annual RAIN Conference hosted by Carolina AgriSolutions Growers Association (CASGA) for the benefit of existing and prospective specialty crop producers. Collaboration associated with the above mentioned board and conference event is intended to build support for the development of need processing infrastructure associated with specialty crop products and the development thereof.

Specific goals related to this project are listed as follows:

Goal 1: Create a **National Muscadine Board** to establish standards for nutraceutical values of grapes. The goal is to set industry standards through scientific data. These standards will provide data to educate consumers on the nutritional value of muscadine products and commodities.

Goal 2: Initiate and execute a conference on “*Adding Value to the Future of Agriculture*” through the Sixth Annual RAIN Conference hosted by CASGA.

Goal 3: Provide technical assistance to educate and assist new and existing specialty crop growers as well as industry leaders to increase productivity and profitability in the muscadine industry. Assist growers with variety selections, vineyard establishment, best management practices, good environmental management practices, food safety training and permitting.

Goal 4: Build support among existing and prospective specialty crop producers and cooperative members to develop a juice processing facility.

Project Approach

This initiative sought to build regional consensus on the development and implementation of production and processing standards related to muscadine production. Through the formal organization of National Muscadine Board, project coordinators anticipate a greater degree of collaboration that will be necessary to move the industry forward. An annual outreach tool of CASGA has been the RAIN Conference hosted for the benefits of the muscadine crop producers in South Carolina. Through the continued delivery of the conference, organizers intend to support the industry in a manner that results in increased production and new venture development under a branded identity. Technical support provided to existing and prospective cooperative members will help ensure that specialty crop producers benefit from the most accurate information available on muscadine crop production and processing.

The National Muscadine Board consists of industry leaders specifically focused on the production and processing of muscadine value added products and was established through the efforts of the Carolina AgriSolutions Growers Association. The group has identified the need to collaborate on the establishment of national standards and branding to protect the Muscadine Industry. This group is represented by the leaders in the Muscadine Industry from South Carolina, North Carolina, Arkansas, Georgia, Florida, Texas and Mississippi.

Through the Southeast Regional Fruit and Vegetable Conference, the NC Muscadine Growers Association, the Florida Grape Growers Association, and the annual meeting of the Georgia Muscadine Growers Association, CASGA has worked to build consensus on the need for national processing standards and a unified branded identity associated with muscadine specialty crop production. Similarly, CASGA has worked to get buy-in from all Southeastern state producers with regard to branding and quality standardization for Muscadine Products.

6th Annual RAIN (Research, Agriculture, Industry and Nature) Conference: The 2010 conference theme was “The Business of Agriculture in South Carolina”. In an effort to attract a broad spectrum of producers from across the state, the conference was held at the Clemson University Sandhills Research and Education Center in Columbia, SC. Conference planning and execution was made possible through the support of the Clemson Cooperative Extension Service. CASGA set up site location, exhibitors, sponsorship, promotion, meals, SCDA Specialty Foods snacks, speakers and coordinated registration. The agenda consisted of project displays speaker presentations, informative demonstrations from agricultural agencies and specialty crop producers. *See Appendix B: RAIN VI Conference Program.*

The conference highlighted SC Certified Grown and opportunities for small and larger specialty crop growers to participate in value added agriculture. CASGA took the lead in facilitating, hosting and following up on the conference. The evaluation was conducted by Blake Lanford with Clemson Extension. Additional conference collaborators included the Palmetto Agribusiness Council, Palmetto Institute, Clemson University, South Carolina Farm Bureau, Francis Marion University, the University of South Carolina and the South Carolina Department of Agriculture.

Following up on RAIN Conference proceedings CASGA has provided technical assistance to educate and assist new and existing specialty crop producers. Through the working efforts of the CASGA Executive Director, over 65 producers have been assisted by a combination of farm visits, group meetings, and other communications. Additional assistance has been provided by the president of CASGA. This assistance helped growers with variety selections, vineyard establishment, good management practices, good environmental management practices, food safety training and permitting. CASGA has also continued to work with Clemson University on the Pee Dee REC Vineyard. The Executive Director has assisted growers and potential growers with marketing ideas, funding opportunities, and other new ventures such as agritourism, CSA's, Farm to Chef programs, hospitality opportunities, new product ideas, specialty foods and more. The CASGA President has promoted the mission and purpose of CASGA at statewide events.

In an effort to build support for CASGA members to develop a Juice Processing Facility cooperative representatives have conducted planning meetings with USDA AMS. AMS staff developed a survey to check grower interest and commitment and tentatively agreed to do a feasibility study for a CASGA owned and operated juice processing facility. Due to a limited response on behalf of producers, the feasibility study is on hold.

In the meantime, CASGA purchased grapes for the Pee Dee Research and Education Center Vineyard, which were harvested by Foster Family Vineyards and then processed at DeVine Foods. The juice is labeled as a CASGA/Certified SC item that is being used as a public relations product to promote our efforts.

Goals and Outcomes Achieved

Goal 1: Establish a National Muscadine Board: CASGA has led the effort to create a National Muscadine Board which establishes standards for nutraceutical values of grapes. To date the board remains loosely organized due to many differences in the industry. All grower members have an interest in protecting the markets of muscadines and agree that setting standards and branding are key factors in protecting the industry. CASGA efforts have helped to create the awareness and communications needed to set the standards and national branding so that the SC muscadine industry can grow to a higher production level.

Goal 2: Host the 6th Annual RAIN Conference: The 6th Annual RAIN Conference was a great success. There were (101) participants with (12) presentations that were very informative to everyone present. As a result of the conference, cooperative membership grew in 2010. We had the opportunity to follow-up with over 75% of the attendees on projects, expansions, questions, etc.

Conference evaluations indicate that some attendees plan to expand and improve their existing operations as a result of attending the conference. Some attendees plan to start new ventures with value added agriculture.

Goal 3: Providing Technical Assistance: Technical assistance through CASGA has resulted in the following outcomes:

- A new 4 acre vineyard in Gilbert where grapes are being produced and harvested for juicing
- Plans for a new vineyard and winery in Manning; expansion of currently operating vineyard and winery in Ridgeland
- Santee vineyards in Vance has increased productivity
- Through an increase of 136 acres over a 2 year period muscadine acreage is up by approximately 30%. CASGA will continue to assist growers in the identification of stable markets to support their production.

Goal 4: Support the Development of a Juice Processing Facility: The efforts to develop a CASGA Juice Processing Facility are still on-going. CASGA has and continues to work to create interest from growers to participate in surveying the opportunities to be a part of a potential growing industry for muscadine juice and other value added products from small fruits and vegetables. We have succeeded in working with *NESA, SC Commerce Dept., SCDA, SC Farm Bureau, Clemson Economic Development Team, PABC, Palmetto Institute* and others in the expansion of Agribusiness Economic Development for this and other projects. We have fallen short of getting the participation in the grower survey. This is partly due to the economic situation. Some of this is also due to lack of some growers interest in working together in a cooperative. Due to lack of participation in the survey the USDA Feasibility study is on hold. However we have a study of the potential of the entire muscadine industry done by Clemson

University. This was done for CASGA and gives some interesting insights.

Beneficiaries:

“SC Agribusiness Economic Development through CASGA” has been a great success. The activities funded through this grant have and will continue to enhance the muscadine and specialty crop producers in South Carolina. The success of the 6th Annual RAIN Conference has assisted many specialty crop growers for this and coming years. CASGA is currently making plans for another great RAIN Conference. This year’s conference will be expanded even more. The grant has allowed CASGA to give much needed assistance to new and existing growers of muscadines and other specialty crops. This has led to business development with more to come in the near future. The grant has helped CASGA to start the process of setting standards for muscadine products as well as national branding. This is moving slower than expected due to efforts outside of CASGA’s control. Great strides have been made towards building a case of support for CASGA members to develop a juice processing facility. This has been limited due to economic challenges and slack response to USDA Grower Survey. However, CASGA will take this foundation and move forward to help create new marketing strategies for muscadines and other specialty crops.

Additional growers are coming on board and will provide economies of scale to help attract processing companies as well as open new market opportunities. The efforts of CASGA over the past few years could continue to increase the muscadine acreage by more than 30% in the state. The focus has been on helping growers to identify and / or establish strong markets. These efforts will be continued in the future to “Add Value to the Future of Agriculture in South Carolina

The beneficiaries of CASGA efforts in forming the National Muscadine Board to set standards and establish national branding are many. The entire industry is benefiting from efforts to communicate and work together to grow the entire industry and protect the integrity of this healthy and nutritional fruit. When the standards and branding are completed it will allow the entire agribusiness model to expand from production, processing, and marketing. This will allow more product development and expansion of domestic and international markets.

The beneficiaries of CASGA efforts in 6th Annual RAIN Conference were all who attended.

The beneficiaries of CASGA efforts of providing technical assistance to existing and new growers are the growers themselves and the economic impact they will have on their communities and the state of South Carolina. These increased acres could help open up new markets down the road.

The beneficiaries of CASGA efforts to develop a Juice Processing Facility are the growers and agribusiness partners involved, as well as the economic impact they will have on their communities and the state of South Carolina. A processing facility of any kind can increase acres and other related businesses in the region.

Lessons Learned

- Follow-up and planning to use the information and networks established is the key to a successful conference.
- It is difficult gathering useful data from potential growers. Most growers see their experience as proprietary information and are reluctant to share their knowledge with others.

Contact Persons

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Additional Information:

Appendix A: Research information on grapes:

Immune Benefits of Consuming Red Muscadine Wine

Susan S. Percival, Charles A. Sims, and Stephen T. Talcott
University of Florida Extension, Institute of Food & Agriculture Sciences

What do we know about the health benefits of consuming muscadine grapes and their value-added products?

Leon Boyd, Department of Food Science, North Carolina State University, Raleigh, NC

Natural Products and Health Emphasis on Cancer

Dr. Lyndon Larcom & Dr. Patricia Tate, Clemson University

Induction of Cell Death in Caco-2 Human Colon Carcinoma Cells by Ellagic Acid Rich Fractions from Muscadine Grapes

Susanne U. Mertens-Talcott, Joon-Hee, Susan S. Percival, and Stephen T. Talcott
Journal of Agricultural and Food Chemistry

Ellagic Acid and Flavonoid Antioxidant Content of Muscadine Wine and Juice

Stephen T. Talcott and Joon-Hee Lee
Journal of Agricultural and Food Chemistry

Red Wine Ingredient Increases Endurance, Study Shows

Nicholas Wade/November 17, 2006, New York Times

Antioxidants in Muscadines and Measure of Potential

Paulk Vineyards

Inhibition of Metalloproteinase Activity by Fruit Extracts

Patricia Tate, Jason God, Qi Lu and Lyndon L. Larcom
Clemson University
Robert Bibb, Dermacon Inc., Conway, SC

Ellagic Acid and Quercetin Interact Synergistically with Resveratrol in the Induction of Apoptosis and Cause Transient Cell Cycle Arrest in Human Leukemia Cells

Susan U. Mertens-Talcott, Susan S. Percival
University of Florida Extension, Institute of Food & Agriculture Sciences

Appendix B: RAIN VI Conference Agenda

PLATINUM SPONSORS




GOLD SPONSORS



South Carolina Tobacco Growers Association



FIREFLY DISTILLERY
SOUTH CAROLINA



SOUTH CAROLINA FARM BUREAU



ARBORONE FARM CREDIT



HYMAN vineyards

SUPPORTERS



CLEMSON
UNIVERSITY FOR ECONOMIC AND COMMUNITY DEVELOPMENT



USDA



SOUTH CAROLINA Specialty Food Commission

RAIN VI CONFERENCE



HOSTED BY
CAROLINA AGRI-SOLUTIONS
GROWERS ASSOCIATION




"The Business of Agriculture in South Carolina"




Sandhill Research and Education Center
 900 Clemson Road, Columbia, SC
 January 29, 2010



Carolina AgriSolutions Growers Association
 "Adding Value to the Future of Agriculture"

MISSION AND PURPOSE

- Preserve and sustain agriculture for the overall quality of life and profitability of the Carolina Region;
- Development and marketing of enhanced, value-added agricultural products and services;
- Facilitate the production and marketing of new and alternative fruits and vegetables that can help improve public health while simultaneously rejuvenating agriculture in the region; and
- To do any and all things permitted under the Cooperative Marketing Act of South Carolina (Title 33 Chapter 47 of the Code of Laws) upon the adoption of a Board Resolution, approved by no less than ¾ of the Board or a majority.

"The Business of Agriculture in South Carolina"

8:30 am	Registration / Exhibitor / Networking <i>Refreshments</i>
9:00 am	"Welcome to Sandhill REC" <i>Dr Mac Horton, CIECD Director</i>
9:05 am	"Welcome to RAIN" – History of RAIN / CASGA <i>Greg Hyman, CASGA President</i>
9:25 am	Update on CASGA and Muscadine Initiative <i>Jody Martin, CASGA Acting Director</i>
9:45 am	Video — "SC Certified Grown" 
9:50 am	Agri-Tourism Value Added Opportunities <i>Scott Thompson, Thompson Nurseries & Farm</i>

10:10 am	BREAK / Exhibitors & Networking
10:40 am	Keys for the Growth of Agribusiness Development in SC <i>Jim Fields, Palmetto Institute, Executive Director</i>
11:00 am	Web Presence / CASGA Services <i>Jody Martin, CASGA Acting Director</i>
11:15 am	Impact Studies / Feasibility Study / Agritourism <i>Dr. David Hughes, CIECD</i>
11:35 am	"The Business of Agriculture in SC—Making It Grow" <i>Bowland Alston, "Host of Making It Grow"</i>
12:00 pm	Taste of SC Lunch "Fresh on the Menu" <i>(Ben Weeks) www.SpottedSalamanderCatering.com</i> 
12:55 pm	Video - "SC Certified Program"
1:00 pm	Connecting Growers to Restaurants and Direct Markets – CSA's — <i>Tim Will, www.FarmersFreshMarket.org</i>
1:25 pm	"SC Goal of 50 / 20 "What Part can We Play?" <i>Commissioner Hugh Weathers</i>
1:55 pm	"Where Do We Go from Here?" <i>Greg Hyman, CASGA President</i>
2:25 pm	CASGA Membership Meeting <i>Lower level of Lake House</i>
2:30 pm	SC Wine and Product Social—Hosted by: SC Specialty Foods Association / Exhibits / Networking
3:15 pm	Adjourn

"HAVE A SAFE TRIP HOME!"

Project Three: Modification of Darwin mechanical thinner to enhance grower profitability and labor efficiency in peach production

Sub-recipient: Clemson University Extension

FINAL REPORT

Project Summary

Orchard labor is a major focus of discussion among peach growers. High production costs make it important for our growers to enhance orchard labor efficiency, fruit quality and yield. Bloom thinning is required to gain market acceptable fruit size in certain varieties of peach. A standard grower practice is to remove approximately 60% of the flowers buds over the entire fruiting area by hand labor. Costs, depending on variety, age and structure of the tree can reach \$300-\$500 per acre. The Darwin PT 250 Mechanical Bloom thinner has successfully demonstrated its use in European apple and pear systems where it was developed. In 2009, trials began to test this machine in peaches. The assumption is that removal of 45-50% of flowers in the upper canopy by mechanical means will reduce labor inputs for green fruit removal and offer a comparable increase in market size distribution of harvested fruit.

Significant progress has been made towards achieving project goals and objectives, which were to modify the existing Darwin PT 250 mechanical bloom thinner to enhance mobility, efficiency, safety and ease of use in peach production and 2) to evaluate the performance of the modified system in growers' orchards in the Ridge area of SC. The activities during the first year of this project were mainly concentrated on the modification and testing of the bloom thinner. The second year focused on increasing the efficiency of the mechanical bloom thinner after the below described changes were made and testing of the bloom thinner.

Project Approach:

At the initiation of the project, the mechanical bloom thinner was tested for almost 40 hours to identify the source of an existing problem "not being able to adjust the position of the spindle while operating." This alone, makes reaching awkward positioned scaffolds difficult and adds to operator fatigue. It was determined that the hydraulic flow to the spindle drive motor and the spindle positioning cylinder was not sufficient for the satisfactory control of these units. This problem was mainly due to the tractor's open-center hydraulic system which most of the present small tractors used in orchards are equipped with.

To solve this problem, an independent, PTO-driven, hydraulic system was designed to power the drive motor and any other special functions we might adapt to this piece of equipment. The hydraulic system is equipped with a 25 gpm pump, which helps to throttle back a great deal, since the spindle drive motor requires only 6 gpm. The 25-gpm system was over-designed by choice to allow the thinner to be used at lower tractor engine rpm which saves fuel, offers a wider range of ground speeds, and is less stressful to the operator. The unit costs about \$2500, however, a smaller system (10-gpm) would be adequate for this purpose and would cost a lot less (about \$1,000).

As no orchard has 100% perfect trees in regards to scaffold orientation (high density quad, true-v, or open center culture), maintaining an optimum spindle to scaffold position is an essential factor for the success of the mechanical thinner. The existing Darwin thinner allows up to 15 degrees of vertical movement in the opposite direction of tree rows, which was inadequate in our trials. We either missed

the bottom half of the scaffold in the high density or "over engaged" the top resulting in higher than desired thinning. Therefore, the lower tilt cylinder mounting pin was repositioned to increase vertical movement by 8 degrees. A square tubing (2"x2") with two mounting holes to accommodate a machine pin was used for this purpose. Our goal was to achieve a total vertical movement of 25-27 degrees; however, vertical movement beyond 23 degrees resulted in the slapping of thinning cords on the frame during operation. This modification helped working in quad-v and perpendicular v trees a breeze with only limited steering of the tractor to engage the scaffolds. In addition, the flow control valve on the tilt cylinder was moved to the opposite end nearest to the cylinder rod. This helped to gain some downward buffering of the spindle arm when operating in the horizontal position and improved the rapid drop when attempting to sweep inside the vase of our open center trees.

This modified design was presented at the SCRI Technologies Advisory Meeting, Hershey, PA, in 2010. As a result, the manufacture of the Darwin thinner (N.M. Bartlett, Ontario, Canada) has incorporated this modification into its new units.

The Darwin thinner was mounted on a traditional loader with pallet forks and the loader's joystick was used to run tilt cylinder and up/down function. The system was tested in approximately 50 acres in our three trials during 2010 season, with an additional 20 acres free lanced. One interesting trial was on the Scarlet Prince block where the machine was operated over the top and also along each side the tree to accommodate the huge amount of fringe blooms. The results showed, even at 4 passes per row; the labor and basic equipment costs were about only a \$26/acre as compared to manual bloom thinning costs of \$150/acre.

For the 2011 trials, the hydraulic system on the Darwin thinner was fine tuned to improve mobility, efficiency, safety and ease of use in peach production. The new modified system was tested in growers' orchards in the Ridge area of SC. The tests which were performed displayed very positive results from the modifications. The operator of the thinner experienced less fatigue during the trials. Also, the range in which the Darwin was able to access on the tree improved the results significantly. The spindle arms were much more specific to accessing their target areas. The goal of entering any orchard without creating damage to the trees was achieved. The mathematical target of 40-50% total bloom removal was recorded.

In 2011, testing of the effectiveness of this devise was conducted in a commercial 6 leaf block of open center, Coronet-N designed in a replicated trial with two mechanical treatments of the Darwin 250 and the grower standard hand bloom thinning as the check. Treatment 1 (T-1) was the Darwin operated over the top and along the sides with minimal movement of the spindle into the vase. Cord arrangement on the spindle was 9 cords opposed, operated at 225 rpm at a speed of 2.0mph. Treatment 2 (T-2) was operated over the top with the spindle swept or moved into the vase. Cord arrangement, rpm and ground speed were the same to both treatments.

Bloom counts were recorded pre and post thinning on T-1 and T-2 with 60% grower target used for control treatment. Scaffold limb and area of consideration for bloom removal counts were the upper 50% of the scaffold limb (area of mechanical operation) on outer scaffolds (those oriented nearest the row middle) and inner scaffolds (those oriented in line with the row).

All treatments were followed by green fruit removal with labor costs recorded by grower records. Equipment cost for the Darwin treatments based on \$40/hr for equipment and labor.

In 2011, bloom removal for T-1 averaged 55.2% for the outer scaffold and 37.3% for inner scaffold locations. For T-2, bloom removal averaged 61.6% for outer scaffolds and 64.2% for inner scaffold locations. Bloom thinning cost for the checks (GS) was \$497 with mechanical costs for the Darwin being \$33 and \$16 per acre respectively for T-1 and T-2. Green fruit thinning costs increased for T-1 to \$246 compared to Control (GS) of \$185 while T-2 reduced to \$175 per acre (Figure 4). Overall thinning costs inclusive of the costs for the mechanical operation were \$683 for grower standard, \$279 for T-1 and \$191 for T-2 or a reduction of 59-72 % (Figure 5). Though not expected, a modest increase in fruit size distribution resulted in an overall increase in gross revenue of 7.6% for the more effective treatment (T-1) vs. the control.

Figure 4: Total green fruit thinning costs for the Coronet-N trial.



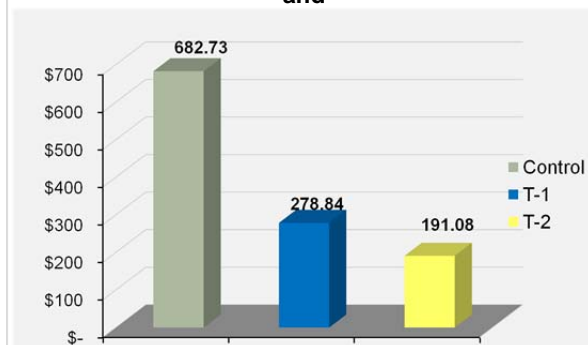
Goals and Outcomes Achieved:

While a mechanical method of bloom thinning is not as uniform as complete thinning by hand, in this trial, positive results were seen in both potential labor savings and fruit size compared to hand operations and follow-up green fruit thinning. The orientation of scaffold limbs in traditional open center systems makes a flat over the top operation combined with a side treatment of the Darwin less effective than sweeping the interior of the vase due to less thinning of the interior scaffolds.

A report providing all information regarding this project has been made to the public in the following publication:

Reighard, G.L. January 2011, Volume XI, The South Carolina Peach Council Annual Research Report. 'Innovative Technologies for Thinning of Fruit', pgs 49-55.

Figure 5: Total thinning inclusive of hand thinning and



This report is distributed to all members of the South Carolina Peach Council (29 growers) and all Clemson Extension offices in the state. Those attending the annual Peach Convention in Savannah, GA also receive a copy for free. In addition to SC growers, peach producers from GA (8), TN(3), AL (6) and NC (2) were also present and received the written publication. During the presentation of this research project at the Educational Sessions, more than 75 attendees were present.

Lessons Learned:

The results in 2010 showed, even at 4 passes per row; the labor and basic equipment costs were about only a \$26/acre as compared to manual bloom thinning costs of \$150/acre. We did not hit our target of a mathematical 40-50% total bloom removal due to the inconsistency of the trees and most importantly, reluctance to strip upper fruiting wood. However, where it did contact the tree in a proper fashion, spacing was within that target range on those tests.

Without modification, current Darwin thinners installed on small orchard tractors, will not have sufficient hydraulic flow for the satisfactory control of the spindle drive motor and the spindle positioning cylinder. Hydraulic limitations are no longer a concern with the modifications done in 2010 at the Edisto Research & Education Center. The hydraulic system on the Darwin thinner was fine-tuned in 2011 to improve mobility, efficiency, safety and ease of use in peach production.

BENEFICIARIES:

Labor for orchard is a major focus of discussion among peach growers. The results of this project will help SC peach growers to reduce labor costs, increase fruit size, enhance farm profit, and become more competitive in the global market.

During the grant period, approximately 220 acres of peach orchard have been utilized in trials, demonstrations, or grower trainings. In addition, 10 workshops (24 participants) were conducted for peach growers. Presentations of research findings have been given in South Carolina, Georgia, Florida and Pennsylvania. Three field days were conducted for the growers in the upstate area of SC, offering this technology to smaller producers who have higher costs due to limited labor. There were 48 participants at the field days, including growers and research personnel.

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Project Four: On-farm evaluation of *Brassicas* sp. with Resistance to Bacterial Leaf Spot
Sub-recipient: Clemson University

FINAL REPORT

Project Summary

Brassica leafy greens are one of the most economically important vegetable commodity groups grown in the southeastern United States, and more than 28,000 metric tons of these crops are harvested in the U.S. annually. Collard and kale (*Brassica oleracea* L. Acephala Group), mustard green (*Brassica juncea* L.) and turnip green (*Brassica rapa* L.) are the most commonly planted members of the Brassica leafy greens group. In the last 10 years, numerous occurrences of bacterial blight on these leafy vegetables have been reported in several states. One of the pathogens responsible for this blight is designated *Pseudomonas cannabina* pv. *alisalensis*. Two *B. rapa* (G30710 and G30499) and two *B. juncea* (PI418956 and G30988) plant introductions (PI) that exhibited moderate to high levels of resistance to this pathogen in greenhouse studies were tested for field resistance in comparison to eight commercial cultivar representatives of turnip green, mustard green, collard and kale. The two *B. juncea* PI and one of the *B. rapa* PI (G30499) were found to have significantly less disease than all tested cultivars except Southern Curled Giant mustard green (*B. juncea*) and Blue Knight kale (*B. oleracea*).

Project Approach

Four field studies were conducted wherein 12 leafy brassica cultivars or Plant Introduction (PI) lines were evaluated for response to the bacterial blight pathogen, *Pseudomonas cannabina* pathovar (pv.) *alisalensis* (formerly named *Pseudomonas syringae* pv. *alisalensis*). The 12 entries included four accessions that were resistant in previous greenhouse screenings and eight widely grown commercial cultivars, including Blue Max and Top Bunch collard, Blue Knight kale, Alamo and Topper turnip greens, Tendergreen spinach mustard, and Florida Broadleaf and Southern Curled Giant mustard greens. The resistant PIs were *Brassica juncea* (mustard) accessions G30988 and PI 418956 and two accessions of *B. rapa*, G30499 (similar to Chinese cabbage) and G30710 (similar to bok choy).

The spring 2010 field study was done at a small grower's farm in Lexington County South Carolina. Because of several problems that occurred during this study (uncontrolled *Cercospora* leaf spot and insect damage), the other three trials were done at the Clemson Coastal Research and Education Center, Charleston, SC. The entries were transplanted to the field in two, 20-ft-long rows replicated four times and sprayed with a suspension of bacteria. Disease severity was rated visually (Table 1) and 0.5 meter of one row was harvested (Table 2). Leaves were sorted into diseased and healthy categories and weighed. Data were analyzed statistically and a manuscript describing the results of these studies has been written and submitted to the journal *Plant Disease*.

The two *B. juncea* PI and one of the *B. rapa* PI (G30499) were found to have significantly less disease than all tested cultivars except Southern Curled Giant mustard green (*B. juncea*) and Blue Knight kale (*B. oleracea*) (Table 1). Averaged over both trials, the two resistant PI lines, G30499 and G30988 had the highest mean healthy leaf weight (Table 3). *B. juncea* G30988 differed significantly from the two cultivars of mustard green and *B. rapa* G30499 differed significantly in healthy leaf weight from the two cultivars of turnip green and the spinach mustard. The healthy leaf weight of *B. juncea* PI418956 was significantly greater than Tendergreen and Topper but significantly less than the more resistant *B.*

juncea G30988 (Table 2). There was a strong inverse correlation ($P < 0.01$) between disease severity and healthy leaf weight in both 2010 ($r = 0.87$) and 2011 ($r = 0.89$).

Table 1. Mean disease severity ratings of bacterial blight symptoms observed on 12 brassica leafy green accessions grown in field trials in fall 2010 and 2011

Cultivar or PI line	Species	Crop	Disease severity (%) Fall 2010		Disease severity (%) Fall 2011	
Blue Max	<i>B. oleracea</i>	Collard	10.61	ab	36.68	a
Tendergreen	<i>B. rapa</i>	Spinach mustard	12.84	a	31.72	ab
Top Bunch	<i>B. oleracea</i>	Collard	9.61	abc	26.84	bc
Topper	<i>B. rapa</i>	Turnip green	10.07	ab	25.52	bc
Alamo	<i>B. rapa</i>	Turnip green	10.88	ab	21.16	dc
G 30710	<i>B. rapa</i>	Bok choy- like	6.19	bc	17.45	de
Florida Broadleaf	<i>B. juncea</i>	Mustard green	4.83	cd	17.35	de
Southern Giant Curled	<i>B. juncea</i>	Mustard green	2.50	de	12.44	ef
PI 418956	<i>B. juncea</i>	Mustard green	1.31	e	8.70	f
G 30499	<i>B. rapa</i>	Chinese cabbage- like	1.31	e	4.83	g
Blue Knight	<i>B. oleracea</i>	Kale	1.71	de	4.74	g
G 30988	<i>B. juncea</i>	Mustard green	0.56	e	0.56	h
P-value				0.01		0.01

Table 2. Mean healthy leaf weight of eight brassica leafy green accessions across two different field trials (Fall 2010 and 2011).

Cultivar or PI line	Species	Crop	Healthy weight (kg) ^y	
Tendergreen	<i>B. rapa</i>	Spinach mustard	0.25	e ^z
Topper	<i>B. rapa</i>	Turnip green	0.37	e
Alamo	<i>B. rapa</i>	Turnip green	0.41	de
PI 418956	<i>B. juncea</i>	Mustard green	0.60	cd
Florida Broadleaf	<i>B. juncea</i>	Mustard green	0.62	cd
Southern Giant Curled	<i>B. juncea</i>	Mustard green	0.74	bc
G 30499	<i>B. rapa</i>	Chinese cabbage-like	0.84	ab
G 30988	<i>B. juncea</i>	Mustard green	0.95	a

^y Combined plot averages of healthy leaves harvested in 2010 and 2011.

^z Means with the same letter are not significantly different, Waller-Duncan k-ratio *t* test, $k=500$ (or $P = 0.01$).

Goals and Outcomes Achieved

Resistance identified in the greenhouse to leaf blight caused by *Pseudomonas cannabina* pv. *alisalensis* was confirmed in three Plant Introduction lines, G30499, PI 418956, and G30988, in the field in spring and fall. In fall 2011, G30988 was more resistant than the other 11 entries. Healthy leaf weight was greater in G30499, G30988, and Southern Curled Giant mustard than in Alamo and Topper turnip greens and Tendergreen spinach mustard. Healthy leaf weight of *B. rapa* PI 418956 was greater than that of Topper turnip greens and Tendergreen spinach mustard, both *B. rapa* cultivars that are so susceptible to bacterial blight that growers have stopped growing these desirable cultivars. A strong significant positive linear correlation was obtained between disease ratings and percent healthy weight of harvested leaves, thus verifying that visual rating is accurate to separate resistant lines from susceptible lines and cultivars. Any decrease in diseased leaf area will increase marketable product.

Outreach.

The information was disseminated through conferences such as the SC Fruit, Vegetable and Specialty Crops Association conference. A presentation entitled “Biologically Based Integrated Management of Bacteria Blight of Mustard Greens” was given on Nov. 29, 2011 at the 26th Annual Southeast Vegetable & Fruit Expo, Myrtle Beach, SC, which is the annual grower conference sponsored by the SC Fruit, Vegetable and Specialty Crops Association and the North Carolina Vegetable Growers Association (<http://www.ncvga.com/2011Program.pdf>). Approximately 40 growers attended the session on Bacterial Diseases in which this presentation was given.

Information will also be disseminated through extension and extension production meetings.

Three presentations were made to vegetable growers in Lexington County:

- “Leaf Blight Disease of Brassica Leafy Greens” on Feb. 16, 2012, Pelion, SC, to 60 growers;
- “Bacterial Blight of Brassica Leafy Greens: Recent Progress at Coastal REC and USDA, Charleston” on Feb. 17, 2011, Lexington, SC, to 50 growers; and
- “Controlling Bacterial Diseases on Peppers and Greens” on Feb. 16, 2010, Lexington, SC, to 58 growers.

Beneficiaries

The beneficiaries of this project are leafy greens growers in South Carolina. Although bacterial blight has been identified in California, Oklahoma, and Ohio, growers in South Carolina have had more problems with bacterial blight than growers in other states because they produce brassica leafy greens year-round without a break period in the summer, when infested crop debris could decay. Year-round production is required so that they can fulfill contracts with produce brokers who prefer to have year-round sources of products. One large South Carolina grower also produces leafy brassica greens in Florida and Mississippi. Bacterial blight was discovered in Mississippi in 2011; thus, this information will be applicable to growers in other states as needed.

Lessons Learned

PI 418956, G30499, G 30710, and G30988 are susceptible to the fungal disease white spot, caused by *Pseudocercospora brassicae*, which occurred in both spring trials to the extent that it interfered with ratings for bacterial blight. Additional fungicide applications will be necessary to manage this disease on these lines and on any resistant cultivars developed from these lines. G 30710, a boy-choy like entry, was not resistant in the field to bacterial blight, even though it was resistant in the greenhouse. Since this

entry has a different plant type than turnip greens, it would be difficult to cross with turnip green cultivars anyway.

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Additional Information

The PI, the two USDA cooperators, and the cooperating Lexington County Extension agent met with two leading growers in Lexington County and two representatives from Sakata Seed Company on Feb. 16, 2012, to discuss the possibility of Sakata producing seed of the resistant mustard green G30988. The group also discussed on-farm strip trials with this line.

Project 5: Advancing the transition from Conventional to Organic vegetable production utilizing precision fertigation technologies and cover cropping
Sub-Recipient: Clemson University

FINAL REPORT

Project Summary

The purpose of this study was to identify methodologies and cultural system practices that make transitioning from conventional to organic vegetable production practical and attractive to South Carolina farmers. Transition to organic agriculture in the south eastern coastal plain is difficult due to a number of factors, primarily due to sandy soil characteristics that inhibit the accumulation of organic matter leading to a lack of adequate soil microbial diversity and activity. Through the blending of organic and conventional production strategies and the use of newly released cowpea lines by the USDA, high nitrogen based organic soil amendments and a novel ammonium based fertilizer produced by Clemson Coastal Research and Education center, it is hoped that this transition is not only possible but highly adoptable and profitable by South Carolina farmers.

Project Approach

A historically conventionally farmed field was sprayed with a contact herbicide in the spring of 2010 to end conventional synthetic agrochemical application of the organic transitioning research site. Next, the field was sub-soiled and disked four times to improve aeration, drainage and aid in weed suppression. Pre-experiment soil samples were taken and total mineral, organic matter content and soil microbiological analysis performed to establish a baseline to examine the effects of the cover cropping cultural systems. A randomized complete block split plot experimental design was implemented and newly released USDA US-1136, US-1137 and US-1138 cowpea cultivars rhizobium inoculated were hand seeded to 20' long plots on double rows 12" within and 18" between on 6' wide raised beds and irrigated with surface laid drip tape in June 2010. Plants were allowed to grow to full canopy, just prior to full bloom and seed pod onset. Individual cover crop plot biomass (Table 1.) and tissue samples were gathered for total mineral analysis (Table 2.) and crop residues mowed into fine green-manure mulch and incorporated in the soil profile.

The mulched covercrops were allowed to decompose for three weeks and black plastic mulch was applied on the same 6' wide beds with drip tape buried 6" deep in the center of the beds. Post covercrop soil samples were obtained and total mineral, organic matter content and soil microbiological analysis was performed and compared to pre-experiment results (Table 3.). The experimental fertigation system was installed prior to broccoli planting. Six week old broccoli cultivars Destiny, Gypsy and Marathon were transplanted into the previously established covercrop plots with the same spacing. Winter-rye-grass seed was seeded at 150 lbs/Ac in the alleys and mowed twice during the production season and was successful for weed control. Organic Material Review Institute (OMRI) approved insecticides were applied according the label and as needed throughout the broccoli growing season to control insect pests. Weekly precision fertigations of actual 80 ppm of a novel CREC invented ammonium nitrogen fertilizer amended with OMRI approved sources of phosphorus, potassium, secondary nutrients and micronutrients were delivered weekly for eight weeks prior to harvest.

Goals and Outcomes Achieved

Objective 1 (2010-2011): The objectives of were to evaluate the three USDA cowpea lines for weed suppression, biomass, organic matter contribution, soil nitrogen influence and effects on beneficial soil microbiology. Secondly, was this influence on three lines of broccoli in the attempt to identify the optimum cowpea line and broccoli cultivar combination that could further be studied in a more production style format. In the 2010-2011 growing season it was determined that of the three USDA cowpea lines screened, US-1138 proved to be superior with regard to weed control contributing 544 g/m² grams per square meter dry biomass, 35% more than the other two cowpea lines. Other biochemical attributes of US-1138 made it the ideal choice for testing in a production setting in the 2011-2012 growing season. Of the three broccoli cultivars screened during the 2010-2011 growing season, 'Destiny' outperformed 'Gypsy' and 'Marathon ' by 44.1% and 66.4% respectively in marketable number and yield in lbs/Ac, making it the ideal choice for testing in production setting in the 2011-2012 growing season. The novel organic ammonium based fertilizer alone did not provide the necessary nitrogen requirements for comparable yields of the conventional 10-10-10 fertilizer.

Objective 2 (2010-2011): Once broccoli cultivar 'Destiny' was chosen for optimal yield and USDA cowpea line 1138 was chosen as a cover crop for optimal weed suppression and for enhancing soil biological diversity and activity, the novel organic fertilizer was determined to be insufficient alone; further investigation of nitrogen based soil amendments were explored. Growing conditions were similar to the 2010-2011 season except cowpeas were seeded on 3' beds 12" within row instead of dual rows on 6' beds. After the cowpea crop was mowed and incorporated, additional soil amendments at 100 lbs/Ac N equivalents were added. Blood meal, fish meal, feather meal, soy-protein-isolate was compared to 100 lbs/Ac N of 10-10-10 and calcium nitrate. It was previously unknown how the now increased soil microbial activity would aide in mineralization of the bound N in the soil amendments. The novel organic ammonium based fertilizer was also fertigated at 200 ppm N weekly to separate plots containing both conventional and organic soil amendments as an additional treatment to test earliness. Calcium nitrate plots yielded late yet had greatest yields. All organic soil amendments yielded statistically similar to the 10-10-10 plots. All plots that received the additional fertigation tended to have slightly earlier yields.

The information has been delivered to specialty crop growers at two meetings thus far, as well as one professional venue. The Clemson Annual Field Day in May hosted 65 growers of specialty crops. Of these, 12 are either certified organic growers, or are in the process of becoming certified. The Florence County Vegetable Growers Meeting had 120 attendees who received the information. While the original target was to expose more than 200 producers to this methodology, and only 185 have been thus far, the project manager expects this number to be exceeded once the project is published.

Also, the information was presented at the American Society of Horticultural Science meeting. Since then, the project manager has been contacted by Extension agents in both Georgia and Alabama, who are interested in replicating the trials for the growers in their states.

To date, no growers have included this methodology of organic broccoli production. However, three growers anticipate having on-farm trials this coming year, through the cooperation of the project manager. These three growers will receive the recommended seed varieties for cover crop use by the USDA at no cost, and will begin the process of transitioning areas of their farms to organic broccoli production. All three are located in the coastal range of the state; one is minority.

Beneficiaries

Observations and results from the first year were discussed with South Carolina growers at Clemson's Annual field day which was held in May 2011. 65 growers were present, and were briefed on the research and lessons learned that would be incorporated in the Summer/Winter 2011 trial. Conventional, transitioning and organic growers (78 present; 6 certified organic producers of specialty crops) who were present at a Clemson Extension Sponsored Vegetable meeting in Clarendon County SC were briefed on conclusion from both years of research. Recommendations were given and the information for acquiring samples of USDA cowpea lines 1136, 1137 and 1138 were made available.

Lessons Learned

In the 2010-2011 growing season it was determined that of the three USDA cowpea lines screened, US-1138 proved to be superior with regard to weed control contributing 544 g/m² grams per square meter dry biomass, 35% more than the other two cowpea lines. Other biochemical attributes of US-1138 made it the ideal choice for testing in a production setting in the 2011-2012 growing season. Of the three broccoli cultivars screened during the 2010-2011 growing season 'Destiny' outperformed 'Gypsy' and 'Marathon' by 44.1% and 66.4% respectively in marketable number and yield in lbs/Ac, making it the ideal choice for testing in production setting in the 2011-2012 growing season. The novel organic ammonium based fertilizer alone did not provide the necessary nitrogen requirements for comparable yields of the conventional 10-10-10 fertilizer.

However, in the 2011-2012 growing season when the organic liquid fertilizer was fertigated at 200 ppm N weekly into plots of 100 lbs/Ac N equivalents of blood meal, fish meal, feather meal, soy-protein-isolate were statistically similar to control plots containing the 100 lbs/Ac N of 10-10-10 alone. All fertigated plots tended to produce earlier yields than non-fertigated plots. However the calcium nitrate control plots containing 100 lbs N/Ac yield the greatest and heaviest yields, yet yields were delayed and came in later than any other plot potential due to rapid early foliar development.

Utilizing USDA cowpea line 1138 along with plastic mulch, drip irrigation (fertigation) and winter rye grass as weed control in the alleys is a unique and successful means for transitioning growers to obtain comparable marketable yields while increasing soil organic matter and microbiological diversity and activity. Further research in the area of increased beneficial soil microbial activity through cover crops and mineralization of organic soil amendments and these effects on other crops are needed.

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Additional Information

Table 1. Tissue mineral analysis of cowpea after mowing and forced air drying.

Tissue samples	Dry Weight (g/m ²)	N	P	K	Ca	Mg	S	Zn	Mn	Cu	Fe	Na
		%						ppm				
1136	351.5	3.3	0.3	2.4	1.0	0.3	0.2	30.5	42.3	18.3	708.8	79.9
1137	351.5	3.4	0.3	2.7	1.0	0.3	0.2	35.5	52.8	15.8	444.0	34.0
1138	544.3	4.0	0.4	2.6	1.2	0.4	0.2	47.3	67.8	26.5	1140.3	32.3

Table 2. Average soil mineral analysis three weeks after cowpea mowing, incorporation and plastic mulch application prior to broccoli planting (pooled over all treatments and replications).

Soil samples	P	K	Ca	Mg	Zn	Mn	Cu	B	Na	NO3-N	OM*
	Lbs / acre									ppm	%
None	243	83	2351	200	3.4	17	3.8	0.2	14	5	0.8
1136	254	126	1571	162	3.6	17	3.9	0.2	15	9	1.0
1137	259	127	1132	130	3.5	16	3.9	0.2	13	8	0.8
1138	280	156	1230	136	4.0	18	4.1	0.3	14	12	1.0

Table 3. Soil microbial analysis three weeks after cowpea mowing, incorporation and plastic mulch application prior to broccoli planting. Compiled samples (10 per plot to 8") were pooled, stored in plastic bags, sent on ice and arrived the following day at Soil Foodweb Oregon.

Sample	<u>Bacteria</u>			<u>Fungi</u>		<u>Protozoa</u>			<u>Nematode</u>
	Active bacteria (µg/g)	Total bacteria (µg/g)	Actino bacteria (µg/g)	Active fungi (µg/g)	Total fungi (µg/g)	Flagellates (#/g)	Amoeba (#/g)	Ciliates (#/g)	Bacterial and Fungal feeders (#/g)
None	49.9	591	12.7	48.8	580	1497	15338	153	3.02
1136	43.6	935	6.3	66.3	918	5076	305570	506	10.2
1137	61.8	1100	12.6	76.4	1140	5081	50814	305	9.5
1138	40.0	513	15.9	72.1	955	2368	15338	471	14.2

Project Title: Upgrade SC Peach Council Website
Sub-recipient: SC Peach Council

FINAL REPORT

Project Summary:

The South Carolina Peach Council is an association of growers, packers and researchers who are committed to preserving and sustaining the peach industry in SC. The peach producers in SC steward a crop that has a \$98 million annual economic value. South Carolina is the second leading producer of peaches in the nation, behind California.

In an effort to sustain its market placement, and to become more recognized as a brand, the SC Peach Council has recently driven a stronger marketing campaign. Reaching out to individual consumers and educating them about the benefits of eating local grown, fresh peaches has become a priority. This approach compliments the need for an increased consumption of fresh fruits and vegetables by the general population, but also enables the producers in SC to secure and grow their market percentage.

The Board of Directors of the SC Peach Council agreed the organization website, www.scpeach.com, did not present information to the public and consumers as well as it needed, nor did it support the new image the Council wanted to convey. The web format did not contain any areas of information that was readily available to the targeted marketing audiences, which includes produce industry associates, retailers, food service employees, international salespersons, and media representatives.

It was decided that, as part of a strong marketing program to better influence the consumer to recognize and purchase a SC grown peach, that an improved web format would be critical to this campaign. The updated web format would bring focus to both the consumer, as well as the retailer.

Project Approach:

After a comprehensive review of websites of similarly focused non-profit organizations, CSAs, and leading produce companies, two websites were found to be artistically and logically similar to the website design wanted by the SC Peach Council.

The project manager then found out the companies which created and managed the websites, Pinckney's Produce and the Georgia Fruit and Vegetable Growers Association.

Interviews were then made with the designers of each site.

The company Farm Fresh Ideas, based out of Greenville, SC, was then contracted to redesign the website. Farm Fresh Ideas, together with Amplusweb Services agreed to the following:

- Website Design
- Website Development
- Implement a Content Management System

- SSL Certification
- Website Hosting

First, the initial steps of designing and choosing a main page had to take place. This page will include tabs to secondary pages that will take visitors to further information about producers, peach facts, news stories, recipes and a contact information page. The Board of Directors of the SC Peach Council reviewed several proposed designs/themes created by the team at Farm Fresh Ideas. Information was then given to the web designers to develop the copy required for each page.

The home page will feature bright, colorful photographs of fresh peaches. It will also have a scrolling banner that has digital images of “past and present peach box labels.” These labels are nostalgic and interesting; many people collect them, and have them on display in their home and office. These labels are a link to the rich history of peach production in the State, and are a fun conversational piece.

Features on the home page include industry resources for retailers, recipe information, a sign up for eNewsletters, Facebook and Twitter links, and important links to the Clemson Peach Team, the SCDA, and the Certified SC Grown website.

As the content management system is developed, the project manager, and website manager will be able to add/change the following content: pages, events, press releases, press clippings, events, producer information, variety information and availability, recipes and additional resources.

The website www.scp Peach.com will be used by consumers, retail buyers and managers, roadside stand operators, teachers and researchers as a tool for information and an idea tank for recipes. Marketing materials including leaflets, posters, artwork, and price cards can be downloaded and used by retail mangers as needed.

Goals and Outcomes Achieved/Lessons Learned:

This timeline of this project stretched past its initial projection. A number of setbacks occurred from an administrative standpoint. Delays occurred which were directly related to the ability to create the copy needed to fill all pages on the website in a timely manner. The information and images needed for the following pages was cumbersome to gather: grower producers, packer producers, the history of the industry and the facts about the health and nutrition of peaches, the variety ripeness timeline, storage tips and recipes.

Overall, the website redesign has been more demanding of time, and has required more detailed input than was originally thought by the project manager. The original completion date of having the website up and running by May 2011 was not met. At this point, knowing that misinformation and outdated content was on the current SC peach website, but having the new website incomplete the project manager called a meeting with the website designers. The decision was made that the new website should not be launched until it is complete in its design, and input. The

new launch date is May, 2012. To remedy the situation with the current website, the project manager and the designer went through the website, and made the necessary changes.

The contract between the parties has expired, but as a result of working cooperatively through these many setbacks, the staff working on this project has committed to its thorough completion, which will be in late spring of 2012.

Beneficiaries:

The beneficiaries of this project are the SC peach producers. Within the last year, sales increase more than 13% for the state. While the new website was not live during the 2011 season, the team was able to address and correct a number of problems on the site. Examples of these issues include incorrect contact information for the Director, incorrect information for growers (some listed were out of business, or even deceased), and the entire recipe page had to be reformatted so that persons visiting the site could review the recipes.

The SC Peach Council advertises www.scpeach.com on every piece of literature, recipe booklet, and other promotional items it distributes. Being able to correct the issues which were at hand on the old site, and enable a re-design for further references will be beneficial to the public as well, as it is now accurate, and much more user friendly than before.

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Project Title: Support the 2011 Southeast Regional Fruit and Vegetable Conference Educational Series
Sub-Recipient: SC Peach Council

FINAL REPORT

Project Summary:

The Southeast Regional Fruit and Vegetable Conference is an annual trade show and convention which draws more than 2000 participants each year. The event is held each January at the Savannah International Trade and Convention Center in Savannah, GA. The Conference is hosted by the SC Peach Council and the Georgia Fruit and Vegetable Growers Association.

One of the main reasons the Conference is successful are the yearly educational tracks offered to the participants. Over eight different tracks of educational sessions are held over a two day period. Each track is focused on the cultivation of a specialty crop, for example, raspberry/blackberry, peach, vegetable, Vidalia onion, muscadine, pecan, blueberry, watermelon, strawberry and sweet corn. Seminars are also held on organic production, food safety, and roadside market sales.

The desire to continue offering educational sessions to growers, at a low cost, was the basis for the project. Providing monetary support enabled the SC Peach Council to recruit speakers from different areas of the country, who are proven leaders in research in areas of high interest to the growers. The Conference allows a face to face exchange, in a class room setting for the growers and speakers, thus encouraging active participation and an open floor for questions.

Project Approach:

Each year the Board of Directors for the SC Peach Council selects a Faculty member or Extension agent from Clemson University to act as the Educational Chairperson for the upcoming Convention. Having someone from the academic and research sector of the industry represent the Council in recruiting speakers has two positive implications; first, the Chairperson will know who and what research is taking place for which the (2) growers they work with will benefit the most.

The work for scheduling the speakers begins early each year, typically around June. For the 2011 Convention, Mr. Greg Henderson, Edgefield County Extension Agent served as Educational Chairperson. Upon selection, the Chairperson will start the process of polling the growers in both South Carolina and Georgia, to find out which topics are most desired. Questions pointedly address if the growers are concerned about pests which may have been introduced in the area, integrated pest management, chemical application techniques, improved fertigation systems, improved cultivar selection, etc. Depending on environmental changes, and what pest pressures may be increasing, the topics change from year to year. This is why it is critical for the Chairperson to discuss the topics with the growers. In many cases, this is handled as a one on one conversation. The resultant feedback is then taken by the Chairperson and speakers leading research studies, or those with significant experience or contributions are approached to become part of the program. For those who accept, the grant monies cover the speakers' travel costs, hotel

stay, and honorarium. No meals or beverages are allowed.

The monies (\$7500.00) provided by the funds available from the SCBGP were used towards the travel expenses of the speakers. By enabling this offset of funding to occur, the program registration costs remained the same as the prior years.

Goals and Outcomes Achieved:

The two day educational programs were held on January 7 & 8. The sessions were well received by the attendees. Each peach session averaged more than 75 attendees. Also, when applicable, the participants were able to receive Continuing Pesticide Applicator credits, thus keeping their SC Pesticide Licenses up to date. While this was not a primary goal of the grant, it certainly contributes to the positive outcome of the educational program on the peach industry.

The following topics were presented in the 2011 Peach Educational Sessions:

- Recognizing Stress Factors in Orchards (Dr. Desmond Layne)
- Virus Induced Stress (Dr. Simon Scott)
- Insect Incidence Relative to Tree Stress (Dr. Dan Horton)
- Factors to Consider in an Efficient Fertility Program (Dr. David Lockwood)
- Field Mapping and Water Sensor Technology (Mr. Will Henderson)
- Improving Spray Desposition; The Role of Droplets and Air (Dr. Andrew Landers)
- Orchard Stress Management (Dr. Danny Howard)
- Getting Orchard Sprays on Target (Dr. Andrew Landers)
- Herbicide Stewardship: Good for the Trees, Bad for the Weeds (Mr. Wayne Mitchem)
- Stress Factors Relative to Bacterial Disease Complexes (Dr. Dave Ritchie)
- Addressing Oak Root Rot in Replant Sites (Dr. Guido Schnabel)
- A Case for Cover Crops in Establishing Peach Orchards (Dr. Andy Nyczepir)
- General Issues in Fruit Production (Mr. Jeff Cook)
- Improved Post Harvest Fungicide Application Technology (Mr. Alex Cochran)
- Extending Fruit Quality Beyond the Packing Line (Dr. George Pierce)
- Do Spring Temperatures Affect Fruit Sizing (Dr. Greg Reighard)

Post sessions surveys indicated the 99% of the growers present felt that the speakers did a great job presenting relevant information. 83% of the growers stated that they will incorporate the finding of at least one of the presentations at their orchard and/or packing house operation. More than 90% felt the information presented was timely in regards to the southeast peach industry.

Suggested topics for next year include post-harvest quality studies, environmental concerns and orchard management, improved rootstock development and genetic breeding, and one participant suggested having a study conducted on the changing needs and preferences in consumer packaging.

Beneficiaries:

The beneficiaries of this project are all of the growers who received an update on the most recent findings of the research based on peach orchard management and post-harvest fruit issues. Survey results from prior years suggested to Mr. Henderson to create a speaker panel

that was more “in touch” with the reality of the day to day issues of orchard management. In regards to this program, this term reflected the peach growers’ need to have access to relative, up to date information that is pertinent to the cultural and environmental challenges the peach industry face every day. The growers need to hear research that is applicable to their day to day operations, can improve their efficiency, reduce the amount of chemical applications, and otherwise learn how to better conserve natural resources. The overwhelmingly positive feedback (99%) from the grower surveys indicate that the sessions were more in-touch and that the information presented was timely.

The growers responded in a very positive manner to all of the topics presented, as well as to the speakers.

Lessons Learned:

There were no clear lessons learned in this process. Most, if not all of the lessons gained are tertiary in nature. The two most noted positive outcomes are that in order to have a successful educational program, you need to poll the grower leaders of the industry prior to approaching any speakers, to ensure that the topics wanted by the growers are covered. Mr. Henderson did indeed to this prior to building the agenda for the 2011 meeting, and the success was made evident in the positive feedback from all growers present. Another positive result was the ability for the growers to receive pesticide credits for any applicable sessions. As previously mentioned, this enabled the growers to sustain their current SC Pesticide Applicators License.

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Project Title: Design and Print Marketing and Promotion Banner for Watermelon Industry
Sub-Recipient: SC Watermelon Association

FINAL REPORT

Project Summary:

The SC Watermelon Association (SCWA) acquired two professionally designed banner that have been and will continue to be used at promotional events throughout SC. The SCWA strives to promote and bring consumer awareness to the healthful benefits and consistently high quality of SC grown watermelons. The banners, which features the 'Certified SC Grown' logo, as well the

SCWA logo, printed on both sides is 8' by 3' and are freestanding. The portable size of the banners make it easy to carry them around for displays at retail store promotions, watermelon slicing events, tradeshow, school lunch promotions, and the SC State Fair.

Project Approach:

Newly designed banners were desired by the Program Coordinator of the SCWA. Lightweight and colorful banners prove to be useful at numerous promotional events sponsored by the SCWA. Portability, weather resistance, durability and the ability to withstand windy conditions outdoors were all needed in these new banners.

The design intent of the banners were to create a visually appealing, colorful graphics display advertising the strong and viable watermelon industry in SC. The goal was to create signs that drew people's attention into the booth at which the Watermelon Queen and the other volunteers would be handing out fresh sample slices of watermelon, recipe ideas, and nutritional information about watermelon.

Goals and Outcomes Achieved

Free standing signs (8' by 3') were purchased for the promotional efforts. The lowest bidding company designed and created the new banners. The first banner was purchased in June 2010; the second in May 2011. Since their purchase they have been used at the following events:

<u>Event</u>	<u># of Attendees</u>
Charleston Riverdogs Baseball/Watermelon Night (2010 & 2011)	10,000 total
University Football Camps (4 camps per year)	4,000 total
School Food Fairs/EdVenture Childrens Museum (2010 & 2011)	4,000 total
SC State Fair (2010 & 2011)	18,000 total
Retail Store Promotions	3,000 total
National and State Watermelon Conferences	3,000 total
SC Welcome Center Promotions (2010)	500 total
Watermelon Day at SC State Farmers Market (2011)	1200 total

Beneficiaries

Some say the beneficiaries of this project are all those who received a free slice of watermelon at the promotions. However, the ones who truly benefit are the SC watermelon growers. Each

activity provided an opportunity for consumers to learn more about their product, and in turn generate sales.

Lessons Learned

Consumers are eager to learn more about where their food is being sourced. Many more questions about nutritional information of watermelon are being asked by visitors at these events, especially the “sugar content” of a slice of watermelon. This type of information will be worked into new pieces of POP for distribution in the coming years.

Contact Person

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Project Title: The Feasibility of Consolidated High Bush Blueberry Production Coupled with Intensive Fertility Management and Frost Protection

Sub-Recipient: Carolina Blueberries Group

FINAL REPORT

Project Summary:

The Carolina Blueberries Group is a group of producers who are seeking to evaluate new methods that could be used to increase blueberry production in the state. The use of row cover crops, fertility manipulation, radical soil mediums and growing the blueberries in a pot-in-pot nursery style production have all been identified as methods that could be used to increase production, especially in younger shrubs. Also, growing smaller shrubs in hoop-houses may increase the ability to sell the berries at a higher premium, earlier in the season.

The purpose of this project was to test and develop some of these technologies/methods to reach the goal of providing early production of blueberries to provide additional market opportunities for a high value crop in SC. The purpose of the project was to produce blueberries ready for a very early market currently not being filled in South Carolina. The overhead frost protection provided good protection to the crop and gave use the pricing advantage needed to sustain operations of this nature in our state.

Project Approach:

In the fall of 2009, the project manager assembled information related to the planting dates, fertility, planting preparation and needed supplies for the upcoming project.

During the spring of 2010, 10,000 high bush blueberry whips were planted over 2.5 acres in Calhoun County, located in the Midlands of SC. The whips were divided and planted in 1) a medium made exclusively of pine bark 2) a pot-in-pot system and 3) in areas where a hoop house could later be constructed. During the first year, 2800 plants died due to a lack of irrigation and frost protection.

Star, *Windsor* and *Springhigh* were the 3 varieties of high bush blueberries planted.

Star - a low chill southern high bush variety that requires 300-600 chill hour units. The berries are large and have excellent scar and firmness. The plant is medium in vigor and has a upright growth habit.

Windsor-an early ripening and early flowering high bush with high yield potential and large berry size. It is very vigorous with stout stems and a semi-spreading growth habit. It may abort some or all of its flower buds after mild winters. Berries have good firmness and flavor, but picking scar is variable. *Windsor* has above average resistance to leaf-spotting organisms and moderate resistance to root rot.

Springhigh- a low chill variety intended for early season production. *Springhigh* produces a vigorous, upright bush with limited suckering from the base. It does not tend to be twiggy. It produces numerous flower buds in the fall and is capable of heavy flowering in the spring. *Springhigh* leafs well, shortly after the time of full bloom. *Springhigh* has a large berry that ripens in early spring and has good scar, firmness and flavor. It is also somewhat dark in color.

During the first year of growth, the plants were protected from inclement weather by the use of plastic. In spring of 2011, hoop houses were placed over a portion of the planting site. Also, in 2011 (year two), irrigation and frost protection was installed and the remaining 7000 plants became well established. These plants are still thriving. This leads to the conclusion that irrigation and frost protection are essential components for growing consolidated containerized blueberry plants in an orchard setting.

Blueberry plants require good drainage, and a low pH (4.0 to 5.0) to survive. The Carolina Blueberry Group's system of containerized plants (25gal pots) provides good surface and internal drainage and it also improves root aeration. Because Blueberries are shallow rooted with fine fibrous roots and drought can easily damages the plants, overhead irrigation was emitted once a week in dry weather.

Plastic ground covers were put down to control invasive grasses and weeds in the orchard area. The Blueberry field is divided into 3 lots each containing 13 rows with a total of 39 rows. (See diagram attached.)

The Blueberry plants were staked with bamboo to support stems in wind and heavy fruiting. The stakes also proved to be supportive during the times the plants needed to be frost protected.

Annual pruning was performed in the dormant season by removing old, weak and outlying canes. The number of flower buds was reduced by about 50%. Tall, vigorous shoots were cut back to force branching at a lower level and to control bush height. One-three large, shaping cuts were made to open the center of the bush to develop a plant with 7-8 young vertical canes to force laterals to bear fruit the following spring.

Overhead irrigation that is essential for establishment and survival was installed (The blue boxes on the attached document represent the location of the irrigation sprinklers.) Frost protection was

accomplished by pumping water from irrigation wells only during frost hours. Overhead irrigation proved to be essential in frost protection.

Due to a warm spring the same irrigation system used for frost protection was also used for overhead irrigation to water plants as necessary.

Side Note: As part of the GAP certification the irrigation water and water used for topical sprays is tested once a year and these records are kept on file. If any water test is outside our normal range, we do an observational review of the water source area to see if there are any obvious problems or situations that can be mitigated. All reviews are documented and any mitigation actions are documented in our water testing log. Water sources include a municipal water source and a well.

In the spring $\frac{1}{4}$ lb of 2-6-12 blended fertilizer was applied to the blueberry plants by hand. 6-8 weeks later, $\frac{1}{2}$ lb of 10-10-10 fertilizer was applied by hand.

The first signs of bloom on the blueberry plants occurred in mid March. The flower buds were thinned by hand to prevent over fruiting and/or severe permanent bending of young canes under the fruit weight. The blueberries began to ripen in late spring (mid to late April) and full production was experienced by mid-May. The majority of the volume was harvested between May 10th and June 15th. The amount of production for each plant varied between 300-500 blueberries. The plants have doubled their production volume each year.

Harvest was performed by hand. The blueberries were gathered in large bins and transported by vans from the field to the packing shed. At the packing shed, the blueberries are placed on moving conveyor belts where they were inspected and graded for the highest quality using a combination of sophisticated technological equipment as well as local labor. Berries were passed through a sizer to remove small berries leaving only the largest quality fruit for packaging. Only plump, beautiful berries were allowed to pass the inspection point. After grading, the berries entered a fill-by-weight packing machine. Fresh blueberries are placed in pre-labeled, pint sized (2 cups), clear plastic clam shell containers. The cups are filled and closed, then boxed in flats. Palletized fruit is then stored in a cooler.

The average retail price in 2011 for an ounce of blueberries was \$0.28. The average wholesale price in 2011 was \$0.14 per ounce. The average yield in 2011 was 1.5 lbs/plant. This would have allowed a private producer to receive \$23,520 gross (24 oz x \$0.14 = \$3.36 x 7000 plants). Anticipating the volume to be double in 2012, this calculation would lead to \$47,040.

The funding provided by this grant was used to purchase the 10,000 trees, at \$0.80 apiece, for a total of \$8000. The pine bark/fertilizer costs were \$1500.00, and the remainder of the monies went towards the land preparation.

The members of the Carolina Blueberries Group matched these funds by purchasing the pots, hoop houses, and providing all clearing and planting labor at an in-kind cost. All post harvest machinery was made by private investment.

Goals and Outcomes Achieved:

This project has produced amazing results. Pine bark was selected as the growing medium, due to its highly acidic nature. Blueberries love acidic soil, and will typically produce not only a higher volume of fruit, but also much sweeter fruit than berries grown in soil that has a more normal pH range. The amount of fruit that ripened on the shrubs planted in the pine bark yielded more than 23% of the growers' anticipated volume. Berries were rich in color, sweet in flavor and sizing was consistent. These satisfactory results were attributed to a consistent regime of adequate water fertility and maintenance.

The harvest was estimated at 1.5-2.0 pounds per plant. The fertility program consisted of two applications of an ammonium nitrate based fertilizer, one application in late winter and one application in early summer. The slow release ammonium nitrate was applied at a recommended rate. Due to a mild and rainy winter, the overhead irrigation program start in mid-March, and continued throughout the growing season.

The pot-in-pot system also proved to be a satisfactory method of growing a high density blueberry orchard. The pot-in-pot system enables the grower to install and sustain an orchard in a very environmentally friendly manner. The soil is not disturbed for planting of the trees. Therefore, there are no negative side effects related to the project, such as erosion or runoff. The irrigation system used is a micro-jet system. Using micro-jets proved to save more than 12% of the estimated water needed for the crop.

The hoop houses did not appear to alter the volume produced by the shrubs in either a positive or negative manner. However, the growers are going to leave the houses erected, to see if another year or two may produce significantly different results.

Spring of 2011 was the first time the plants produced significant volume. As a result of the mild winter, there was no reason to frost protect. Unusual weather pattern of early 2012 did create some occasions necessary for overhead frost protection.

The packing facility underwent the rigorous process of GAP Certification. GAP Certification is an annual process costing on average \$500.00. This certification is a vital component of the investment to expand the customer base. GAP Certification will again be sought in 2012.

Beneficiaries:

The beneficiaries of this research will be those interested in adopting these cultural practices for their own use. This project models how a grower can increase yields, while lowering input costs, and irrigation supply requirements. The production plan is in the process of being produced on paper. Until then, the project manager continues to verbally share the information with extension agents, and other growers.

The project was so large in scale, that its results can be viewed as a pilot, not just a feasibility study. The overwhelming success has indeed proved that this system is profitable.

The potential economic impact of this project is unknown. Carolina Blueberries Group will continue encouraging other farmers to grow blueberries in SC. There are approximately 50

blueberry growers in SC, averaging from small to large scale producers. At the moment, less than 1000 acres of blueberries are planted in the state. South Carolina has a great environment for growing this popular Superfruit, as witnessed by its neighbors Georgia and Florida.

There has been a significant level of interest in this method of production from various sectors within and outside the agriculture industry. Such as, producers wanting to purchase between 50-100 plants to begin their own operation in the pot-in-pot system. Also, school systems have approached with the desire to adopt the growing methods established in this project, so that school gardens across the state can incorporate high bush blueberry production into their garden plans, and successfully harvest blueberries for the students before the end of school. The project manager will continue to work with those interested in developing a plan for successful blueberry production on their individual sites.

Over the past 3 years, 200 of the blueberry plants have been given to other growers, schools and individuals who wanted to try growing the plants in this production method. It was anticipated to have at least 5 additional producers adopt these growing techniques and incorporate the methods which proved successful on their farms. To date, two other growers, and 11 schools have adopted the container grown method include:

1. Rick Bell, Barnwell County, 100 plants
2. Kelly Bennett, NC, 8 plants
3. Jim Morris, Heathwood Hall Episcopal School, Columbia, SC, 10 plants
4. 10 public schools in the SC Lowcountry have adopted the container grown method for their school gardens.

An additional benefit to growing in containers is that the 'field' is portable. In other words, a farmer/producer can sell the product and the plants without having to sell the land. This method allows a farmer to maximize the productivity of the land.

A fact sheet about the project is being developed for posting on the South Carolina Fruit, Vegetable and Specialty Crops Website. This fact sheet will contain the plan that was produced for blueberry production utilizing different technologies and fertilization methods that lead to producing more volume earlier in the season, to obtain a higher market value. The fact sheet will highlight the feasibility of using a non-traditional soil medium (100% pine bark, decomposted) instead of planting the shrubs directly in the ground, or using a typical nursery growing medium, which is usually only 45-50% pine bark, depending on the manufacturer and blend. The use of overhead irrigation as a means of frost protection will also be included in the plan.

The project manager is also hoping to be incorporated into the seminar schedule of this organization's annual meeting in December, 2012 to present the findings of this project. There is an average attendance of 500 specialty crop growers at this meeting. Also, Clemson Extension agents have been invited to the farm to tour the plantings, so that information about the new system can be exchanged. The project manager is willing to work with others in order to expand the project, consult on additional plantings of this nature to other growers, or with research personnel in an effort to further publicize the findings of the project.

Lessons Learned:

The main lessons learned about cultivating blueberries in this manner are that a highly acidic soil media is crucial, and that irrigation and overhead frost protection are critical. It was successfully proven that overhead irrigation can be used for frost protection, as well as hoop houses. For many farmers, overhead irrigation may be a less risky input factor.

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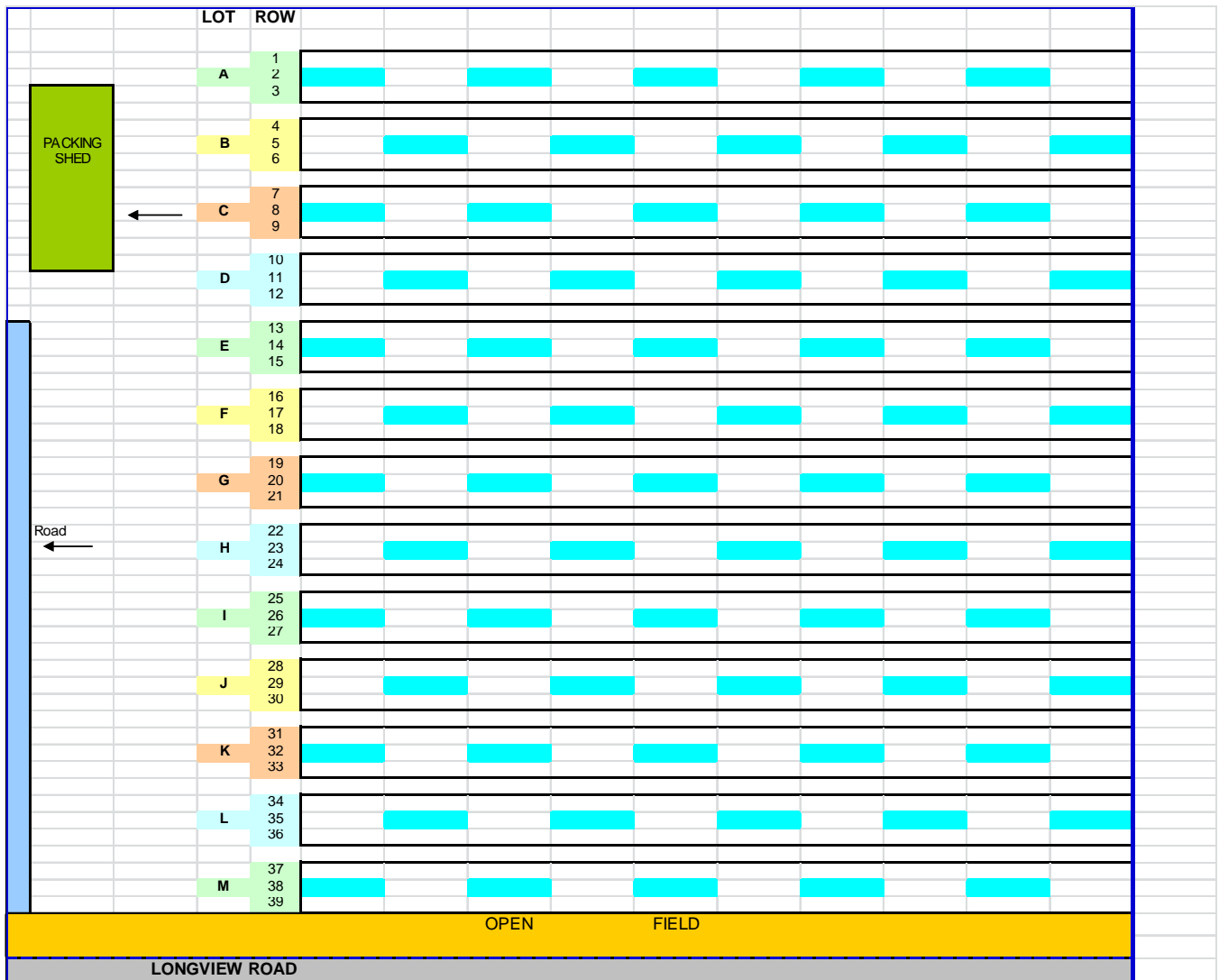
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Example of blueberry shrub after overhead irrigation frost protection.



Project Title: Local Production and Niche Market Development with Native & Exotic Fruit
Sub-Recipient: Clemson University

FINAL REPORT

Project Approach:

The purpose of this project was to establish and maintain three research and demonstration plots (one each in Greenville County, Richland County and Charleston County) to show possible crop diversification by growing native and exotic fruits. Examples of these fruits include rabbiteye blueberry, pawpaw, blackberries, muscadines, figs, pomegranates, and persimmons. Several of these fruits are native to SC, while the others are noted for their ease and trouble free growing habits. Each of these fruits would be well suited for specialty markets, farmers markets, pick-your-own operations and as value added specialty crops.

Overall, the plants being used on the test sites are growing vigorously. However, there have only been few fruits produced. The low production can be attributed to a number of factors: immaturity of plants, drought, and fire ants. At this time, there has not been enough data collected to present information on bloom and harvest dates, volumes, fruit quality measures or additional facts that may be of interest to a commercial fruit grower. As these trees/orchards mature, the information regarding commercial production will continue to be collected and assessed.

Project Summary:

Three demonstration sites were established in the state. The Upstate planting is at Woodmont High School, Greenville, SC. Project coordinator at this location is Mr. Cory Tanner (Clemson Extension, Greenville County Office). The Midlands planting is at the Sandhill Research and Education Center, Columbia, SC. The project coordinator at this location is Dr. Tim Davis (Clemson Extension, Richland County Office). Due to extenuating circumstances for the project coordinator (job responsibility changes and relocation), this site was not completed. The Coastal planting is at the Coastal Research and Education Center, Charleston, SC. The project coordinator at this location is Mr. Roger Francis (Clemson Extension, Charleston County Office). Reports for the Greenville and Charleston sites are noted below.

Location One: Greenville County, Woodmont High School S. Cory Tanner, Manager

Land preparation for the project started in August 2010. A soil sample of the selected area was taken and analyzed at Clemson University soil testing lab. The planting was laid out in "landscape style", using a design created by the Woodmont High landscape design class taught by Mr. Matt Rollins. A total of 8 bed areas were marked in the plot. Each bed is about 6ft. wide. Herbicide was used to kill existing vegetation (bermudagrass). A 3 ft. wide raised soil bed was formed in the center of each row using donated soil amendment.

All soil beds, except those on which the blueberries were planted, were treated with dolomitic limestone at a rate of 5 lbs/100 sq. ft. The limestone was applied to adjust the soil pH from its existing level of 5.6 to a level that is more suitable for the non-blueberry crops. Soil pH for the blueberry bed was not adjusted.

All plants except pomegranates were purchased by December 10, 2010. All crops except for pomegranates were planted on February 28, 2011. We enlisted the help of several Ag-related classes at Woodmont high School and all students had the opportunity to participate in the prepping and planting of the orchard. This aligned with the school's horticulture curriculum. We had media coverage onsite from the local NBC affiliate (WYFF, Greenville). See diagram and photos below for spacing and location of the fruit trees to be planted.

<u>Fruit Trees</u>	<u>Var. Purchased</u>	<u>No. of Trees</u>
Blueberry*	Alapaha	3
	Premier	3
	Brightwell	3
Blackberry	Ouachita	3
	Natchez	3
	Apache	3
Fig	LSU Gold	3
	LSU Purple	3
	Celeste	3
Asian Persimmon	Sheng	3
	Fuyu	3
	Makawa Jiro	3
Muscadine	Darlene	3
	Carlos	3
	Black Beauty	3
Pawpaw	Nyomi's Delcious	3
	Sunflower	3
	NC---1	3
Pomegranate	R---8 - Salavatski	3
	R---9 - Kaj---Acik---Anor	3
	R---19 - Nikitski Ranni	3

*A nursery in Georgia donated the blueberries.

Project Summary Continued:

Location Two: Charleston County, Clemson Coastal Research and Education Center

Project Manager, Roger Francis

The Local Production and Niche Market Development with Native and Exotic Fruit Demonstration plot was established at the Clemson University Coastal Research and Education Center (CREC).

Land preparation for the project started in 2009. A soil sample of the selected area was taken and analyzed at Clemson University soil testing lab. The area was disked two times and rows with raised soil beds were formed before planting. The demonstration site consisted of a total of 5

rows, each row was 6 feet wide and spaced 12 feet apart in the plot. A 3 ft. wide raised soil bed was formed in the center of each row. Bed height was about 18 inches.

The soil bed on which the blueberries were planted was treated with aluminum sulfate at a rate of 50 lbs/150 linear row ft. The aluminum sulfate was applied to adjust the soil pH from its existing level of 6.2 to a level that is more suitable for this crop.

The plot (demonstration site) was planted November 18, 2010.

<u>Fruit Trees</u>	<u>Var. Planted</u>	<u>No. of trees planted</u>
Blueberry	Star	3
	Rebel	3
	Suziblue	3
	Brightwell	1
Blackberry	Quachita	3
	Natchez	3
	Navaho	3
Fig	Champagne	3
	Alma	3
	O'Rourke	3
Pear	Hosui	3
	Shinko	3
	20 th Century	3

Regalgraze clover was planted at a rate of 10 lbs/ac between the rows as a cover crop on November 25. Another planting of Regalgraze clovers was made in October 2012, using the same rate.

Plants that did not survive from the initial planting were removed and replaced with new ones. Below is a table that shows the replaced plants and the new varieties that were substituted for the varieties that were originally planted in the plot.

<u>Fruit Trees</u>	<u>Var. Planted</u>	<u>No. of trees replanted</u>
Blueberries		
Figs	Champagne	1
	Alma	2
	Celeste*	3
Pomegranate	Wonderful	2
PawPaw	Mango**	3
	Rebecca's Gold**	3
Blackberries	Cuttings were started from each var. and planted as needed	

**supplier did not have any O'Rourke available, so used LSU improved*

***new varieties*

All the new plantings have been made, however, the blueberry plants died before they were planted. It is a bit early to determine if the other crops have survived. Because of the time of planting a 100% survival rate is expected.

A summer intern was employed to help with plot maintenance and other activities related to the plot. Each fruit tree variety is identified with a plot marker showing the variety and scientific name.

A drip irrigation system was installed in the summer of 2011. A very sturdy trellis system is currently being constructed for the blackberries.

Overall, the surviving plants are growing vigorously. The pears, figs and pomegranate trees have produced a few fruits in 2011.

The two major problems encountered in the plot are weed and fire ant control. CREC personnel mow between the rows on the regular basis. Individual ant mounds were treated with the insecticide Acephate. Any mounds are a recurring problem.

Problems and/or Delays:

On Friday, March 4, 2011 the Woodmont High School (Location One) Ag teachers noticed that most of the plants installed on February 28th had been stolen overnight. All nine of the Asian persimmons and muscadines, seven each of the blueberries and blackberries, and eight figs were removed from the site and never found. Police investigated the theft, but no suspects were identified. Total financial loss in plant material alone was \$778.41. The plants will be replaced in March 2012.

The major problem for Location Two, in Charleston, is the location of nurseries with selected varieties and quantities of pawpaw and pomegranates. A source for pawpaw (different var.) was identified recently and an order was placed. As soon as these are received the plants will be installed. Again, plot maintenance is a problem.

Goals and Outcomes Achieved:

The four goals outlined in this project that were achieved include 1). To introduce new and adaptable fruit trees to homeowners, farmers and landowners 2). To increase fruit tree production in Charleston County 3.)To encourage crop diversification on farms through the planting of fruit trees 4.) To teach improved fruit tree practices to potential growers.

The information collected from this research is being used to develop a statewide informational fact sheet for producers. Once published, it will be available throughout the state at Clemson Extension Offices, and on the Clemson Home and Garden Information Channel web-site. The number of hits for this site is undetermined.

The number of difficulties encountered within the scope of this project deterred the manager from having grower field days at the planting sites. Instead, the manager travelled the state, and

disseminated the information learned at county extension meetings, and grower meetings. In the upstate area, Dr. Layne presented the information at 5 separate meetings, totaling 176 participants. In the midlands area, one meeting was held with 50 attendees. The two Charleston County meetings where Dr. Layne spoke had a total of 135 people. This brings the total number of specialty crop producers who directly heard about the trials to 361. Clemson PSA also included a static display featuring information about these trials at the annual Sparkleberry County Fair at the Sandhill Research Center for Agricultural and Economic Development Center. More than 32,000 attendees were at the fair in 2011.

The expected measurable outcomes from these achievements the educational outreach in both Woodland High School, and in the educational programs offered and material generated listed here:

Tanner, S. 2012. How sweet it is: Low-maintenance fruit trees and shrubs add a flavorful touch to any home landscape. *South Carolina Living* magazine. March 2012 issue, pages 16-19. (Note: this publication goes to 450,000 residents in the state and it is available on-line; It is included as an appendix to this report)

Layne, D.R. "Fruits that work!", SC New and Beginning Farmers Program – Fruit and Vegetable Workshop, January 13, 2012, Columbia, SC. (50 participants).

Layne, D.R. "The benefits to using native fruit species in the South Carolina home landscape", November 15, 2011, South Carolina Native Plant Society, The Citadel, Charleston, SC (60 participants)

Layne, D.R. "The Nuts and Bolts of Growing Blueberries, Pawpaws and Persimmons in Your own Backyard", PTT parents group and Biology Co-op class of TriCounty Home Educators, Corinth Baptist Church, Seneca, SC, March 2, 2011. (25 participants)

Layne, D.R. "Growing fruit in Upstate South Carolina", Spartanburg Master Gardener Class, Spartanburg Community College, Spartanburg, SC, February 22, 2011. (20 participants)

Layne, D.R. "Native and Exotic Fruits for the Southern Home 'Edible' Landscape", South Carolina Horticulture Industry Trade Show and Seminars, Myrtle Beach, SC, February 3, 2011 (75 participants)

Layne, D.R. 2011. Diversifying your fruit portfolio. *The American Fruit Grower* 131 (1):48-49. (There are 31,000 print subscribers and the article is available on-line).

Layne, D.R. 2011. Fruit Gardening – Segment 8 (video: 12:55 minutes), *On-Line South Carolina Master Gardener Training Program*. Link: <http://www.youtube.com/watch?v=B-r65VMkBl8> (There were 120 participants in the first class. The 2012 class is being offered soon).

Tanner, S. 2011. Grant helps bring exotic fruit to SC farmers. WYFF4.com, February 28, 2011. Link: <http://www.wyff4.com/video/27030256/detail/html>.

Polomski, R. and D.R. Layne. 2010. Native and exotic fruits for the Southern home 'edible' landscape. *The South Carolina Nurseryman*. July/August Issue, pages 18-20.

Beneficiaries:

South Carolina small farmers, new farmers, Master Gardeners, home gardeners, Clemson University students, Woodmont High School students, and the general public.

Lessons Learned:

- Spring is a better planting time for fruit trees (in Charleston County) – optimum (agent's recommendation) than autumn/fall.
- More attention needs to be placed on weed and fire ant control.
- Long-term maintenance will be a major issue in the future.
- Long-term management decisions on insect and disease management are lacking.

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Dr. Tim Davis, Midlands Coordinator (tdvs@clermson.edu, 803-730-7956)

Mr. Roger Francis, Coastal Coordinator (rfrncs@clermson.edu, 843-722-5940)

Project Title: Website redesign, brochure and visuals to support the SC Christmas Tree Association Marketing

Sub-Recipient: SC Christmas Tree Association

FINAL REPORT

Project Summary:

The SC Christmas Tree Association consists of small part-time farmers who are organized to promote the production and marketing of SC grown Christmas trees. Historically, the Association has emphasized production but today the greatest challenge to the small farmer is marketing. The Association upgraded and redesigned its website and produced brochures and visuals to use at promotional events such as the State Fair, with the monies available through the SCBGP.

The Association feels that consumers are becoming increasingly concerned about the environment and would choose real SC farm grown trees over imported fake trees if they had more information about how to find these farms. The upgraded information on the website and in the printed materials will continue to provide information on locations of Choose and Cut operations and other places to find real SC grown trees. This project has benefitted the more than 100 Christmas tree growers in SC and the many consumers who are looking for information on locally grown trees.

Project Approach:

44,000 brochures were printed for distribution. The brochures are 4' x 9', with colored photos on the front and back. The brochure was designed to promote the "green theme" and was designed to be able to utilize for more than one year. More than half of these brochures (25,000) obtained with this grant money have been distributed to date to the general public in an effort to increase the sales of SC Grown Christmas Trees. The brochure refers the reader to our website. The size was picked so that it can be displayed in rack card size for distribution by individual members of the Christmas Tree Association at events (SC State Fair), the State Farmers Market and in rack card displays in businesses. The artwork for this brochure was also used in a Southern Living magazine advertising promotion.

A grower-seller directory brochure was also created. There were 4,000 of this brochure printed. This pamphlet listed the members of the SC Christmas Tree Association by county, operating hours, tree species available, directions to farm, etc. This piece was distributed to the general public at regional fairs, and also the SC State Fair, which is in October, as a tool for consumers during the holiday season. All of these brochures were given out at the SC Christmas Tree Association display at the fair during 2010 and 2011. The display is a popular feature at the fair, as the growers bring in samples of their tops trees to showcase for the public.

The Website was also redesigned. The reinvigorated site now highlights where to locate a SC farm that sells local grown Christmas trees, the different varieties available, the environmental benefits of using a real tree, tree care tips, detailed membership listings, updated news information for members and how to contact the association. The new design also features an individual web page for each grower/member, which allowed growers to customize their messages to the public.

Goals and Outcomes Achieved:

The goal of increasing the marketing efforts of the Christmas Tree Association was met. The Association has experienced a 19%+ increase in membership (38 vs. 45) since receiving the grant and reinvigorating the marketing efforts. Half of this increase was due to members who rejoined due to the Associations' increased marketing activity, and the other half were new members who liked what they saw happening in the association.

The old website was not effective and had little impact on sales. The new web site draws consumers to the individual farms and has made a significant increase in awareness of SC grown Christmas tree availability. Due to a computer error, web site data for 2010 was not collected. During the 30-day sell season of 2011 (Nov 18-Dec 18), the web site had 9,976 visits (8,122 unique visitors) and 37,989 page views. This data will be used as a benchmark for comparison in future years.

An informal 2011 poll of members showed that most members' experienced an increase in sales in between 10-25% from last year. The members stated that they felt like that a good portion of their increase in sales was due to the web site effectiveness, especially the individual farm web page.

Beneficiaries:

The ones that benefitted from this grant are the members of the SC Christmas Tree Association.

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Project Title: Alternatives to Pristine fungicide to control Gummy Stem Blight on watermelon
Sub-Recipient: Clemson University

Project Summary

Since 2003, a 2:1 mixture of the fungicides boscalid and pyraclostrobin (Pristine) has been used widely on watermelon to control gummy stem blight caused by *Didymella bryoniae*. Several isolates of *D. bryoniae* that were insensitive to 10 mg/liter boscalid were found in a watermelon research plot in South Carolina in 2008. A total of 201 isolates collected between 1998 and 2009 were tested for sensitivity to boscalid by determining percentage germination of two spore types, ascospores and conidia, on culture media. All 31 isolates collected in 1998, 2002, or 2005 were sensitive to boscalid. Of the 170 isolates collected in or after 2006, 84.7% were insensitive to boscalid, including 19 of 30 isolates recovered from greenhouse-grown seedlings. The oldest insensitive isolates were obtained in 2006 from a greenhouse and in 2008 from a commercial field. Ascospores were less sensitive to boscalid than conidia. EC₅₀ values (the concentration of boscalid that reduced germination by 50%) were two to three times higher for ascospores than for conidia. In four greenhouse experiments, gummy stem blight severity on boscalid-treated seedlings did not differ among 12 boscalid-resistant isolates. This study is the first report of differential sensitivity to a fungicide between conidia and ascospores in *D. bryoniae*. Because *D. bryoniae* produces conidia and ascospores on diseased hosts, both spore types should be used when calculating EC₅₀ values for boscalid. In the field, using fungicides increased watermelon yields and net returns, even when the severity of gummy stem blight on the foliage was <10% of the leaf area. Fungicide programs that included fungicides to which the pathogen was resistant did not increase yield or net return.

Project Approach

Objective 1. In June 2009, isolates of the gummy stem blight fungus were collected from four fields of commercial watermelons in Colleton, Bamberg, Barnwell, and Hampton County and from watermelon research plots at the Edisto REC in Barnwell County. These isolates were grown on culture medium that included 0.01, 0.10, 1.0, or 10.0 mg/liter boscalid and on control medium without fungicide. The percentage of two spore types, ascospores and conidia, of each isolate that grew on control and fungicide-amended medium was calculated. Each isolate was tested twice. Twelve resistant isolates, six from one farm in Bamberg County and six from Barnwell County, were tested in the greenhouse on seedlings sprayed with the field rate of Pristine (pyraclostrobin + boscalid), Cabrio (pyraclostrobin), Endura (boscalid), or with water to check that they are able to cause gummy stem blight on fungicide-treated plants.

Objective 2. Four field trials with fungicides that can be used in place of Pristine were done in spring and fall 2010 and 2011. Fungicides were applied to watermelon every 7 days seven times per season. Severity of gummy stem blight on leaves was rated visually and marketable fruit were harvested multiple times. The cost of each fungicide program and the profit from the yields was calculated.

Goals and Outcomes Achieved

Objective 1. Boscalid-resistant gummy stem blight fungus (*Didymella bryoniae*) was found in all nine locations where samples were collected in 2006, 2008, and 2009. This included two visits to a greenhouse that grows watermelon transplants (2006 and 2009), six commercial watermelon fields, and one watermelon research plot. Of the 170 isolates collected in or after 2006, 84.7% were insensitive to boscalid, including 19 of 30 isolates recovered from greenhouse-grown seedlings. The oldest insensitive isolates were obtained in 2006 from a greenhouse and in 2008 from a commercial field.

In four greenhouse tests, 12 isolates that exhibited a range of sensitivities to boscalid in culture responded similarly on fungicide-treated plants. In three of four experiments, Pristine reduced gummy stem blight on inoculated seedlings, although the level of control was only 24% and not commercially acceptable. (In previous studies, the level of control provided by Pristine with a sensitive isolate was almost 100%). It appeared that the presence of the less-sensitive ascospores in the inoculum suspension was the reason for the poor performance of Pristine in the greenhouse tests, since ascospores accounted for >65% of the spores sprayed onto seedlings.

Objective 2. In the field trials, gummy stem blight pressure was relatively low in both spring experiments but very heavy in fall 2011 (Table 3). Several different fungicide active ingredients were identified that can be used in place of Pristine. These include Catamaran, Monsoon, Inspire Super, and Switch. Although statistically significant differences were not observed in the weight of fruit harvested, because of differences in costs of fungicides, not spraying fungicides as well as some fungicide programs resulted in a net loss of revenue when watermelon prices were low (\$9.27/cwt, based on prices received in SC in 2007-2009). Over all, Dithane/Monsoon, Monsoon/Switch, Bravo/Folicur, and Bravo/Switch resulted in net profits, even when gummy stem blight pressure was low (Table 1, 2). It is clear that when gummy stem blight pressure is high, there is a large net return, at least \$700/acre, on dollars invested in fungicide use. In spring 2011, when Pristine and Quadris Top were used, returns were negative, likely due to the fact that the test was done with isolates insensitive to Pristine and Quadris (Table 3). This illustrates the danger in using the wrong fungicide when resistant isolates are present. In the fall 2010 experiment, downy mildew infected the control plots so that statistical comparisons among fungicides could not be made.

The results of this study were presented at the 2011 Southeast Vegetable and Fruit Expo, which was held on November 28-30 in Myrtle Beach, SC. Forty five growers were in attendance during the presentation.

Beneficiaries

The beneficiaries of this research are primarily watermelon growers in South Carolina and also other cucurbit growers, such as growers of cantaloupe. This information has been incorporated into watermelon spray recommendations for South Carolina growers (<http://www.clemson.edu/psapublishing/PAGES/PLNTPATH/IL86.pdf>) that, as an Extension fact sheet, is available to other growers as well. At this time, it is not known how many times the fact sheet has been accessed. Clemson is still determining.

Lessons Learned

Downy mildew can be a problem in fall watermelon production along the coast. The trial in fall 2010 was compromised by downy mildew that infected the non-sprayed control plots. As long as growers use a basic protectant fungicide, their crops should be protected from downy mildew and gummy stem blight. Preventative sprays against downy mildew with fungicides that do not control gummy stem blight are necessary to successfully test such fungicides in the fall. This information has been incorporated into the South Carolina Watermelon Spray Guide which is updated yearly for growers (<http://www.clemson.edu/psapublishing/PAGES/PLNTPATH/IL86.pdf>). The SC Watermelon Spray Guide is also distributed to all 108 watermelon growers in the state by the SC Watermelon Association. These growers use this reference for successful crops each year.

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Additional Information

Table 1. Results of the spring 2010 field experiment with 11 different fungicide treatments applied to watermelon affected with a moderate level of gummy stem blight

Treatment (Number of Applications)	Final Disease Severity (%)*	Yield cwt/A	Crop Value \$/A**	Fungicide Cost \$/A	Net Return \$/A***
Water (7)	18.9 a	335	3109	0	(-26)
Dithane (7)	16.9 ab	359	3329	110	84
Dithane (4), Inspire Super (3)	16.9 ab	325	3015	152	(-272)
Dithane (4), Monsoon (3)	13.2 abcd	401	3717	88	494
Dithane (4), Switch (3)	13.3 abcd	341	3163	239	(-211)
Dithane (4), Monsoon (2), Switch (1)	15.1 abc	304	2815	131	(-451)
Dithane (2), Monsoon (3), Switch (2)	11.6 abcd	328	3036	174	(-273)
Bravo Weather Stik (7)	10.0 bcd	311	2883	144	(-396)
Dithane (4), Luna Experience (3)	9.7 cd	294	2725	NA****	NA
Catamaran (7)	8.3 d	349	3232	219	(-122)
Dithane (1), Monsoon (3), Switch (3)	8.3 d	406	3759	217	407

*Means followed by the same letter are not significantly different, $P=0.05$.

**Crop Value was calculated using \$9.27/cwt as the price, which is the average price in 2007-2009 (Farm Facts for South Carolina, No. 2-10, Feb. 17, 2010).

***Net Return was calculated using \$3135 as the total production cost (Clemson Cooperative Extension Watermelon Enterprise Budget, 2008-2009).

****Luna Experience, a new fungicide from BASF, is not yet commercially available.

Table 2. Results of the spring 2011 field experiment with seven fungicide treatments applied to watermelon affected with a moderate level of gummy stem blight

Treatment (Number of Applications)	Final Disease Severity (%)	Yield (cwt/A)	Receipts \$/A*	Fungicides \$/A	Return \$/A**
Water (7)	8.3	310.8	2881	\$0.00	(\$254)
Bravo all season (7)	5.3	346.7	3214	\$52.50	\$26
Bravo (3)/Pristine (4)	8.3	328.8	3048	\$208.50	(\$296)
Bravo (3)/Quadris Top(4)	8.3	355.7	3297	\$142.81	\$19
Bravo (3)/Folicur (4)	8.0	382.6	3546	\$47.50	\$364
Bravo (3)/Inspire Super (4)	6.7	349.7	3242	\$147.50	(\$41)
Bravo (3)/Switch (4)	5.3	406.5	3768	\$260.50	\$372

*Crop Value was calculated using \$9.27/cwt as the price, which is the average price in 2007-2009 (Farm Facts for South Carolina, No. 2-10, Feb. 17, 2010).

**Net Return was calculated using \$3135 as the total production cost (Clemson Cooperative Extension Watermelon Enterprise Budget, 2008-2009).

Table 3. Results of the fall 2011 field experiment with five fungicide treatments applied to watermelon affected with a high level of gummy stem blight

Treatment (Number of Applications)	Final Disease Severity (%)*	Yield (cwt/A)	Receipts \$/A**	Fungicides \$/A	Return \$/A***
Water (7)	96.8 a	344.2	3190	\$0.00	55
Bravo all season (7)	42.0 b	510.4	4731	\$52.50	1544
Catamaran (7)	44.9 b	434.8	4031	\$140	756
Bravo (3)/Inspire Super (4)	20.9 c	481.6	4465	\$147.50	1182
Bravo (3)/Switch (4)	21.0 c	446.2	4136	\$208.50	792

*Means followed by the same letter are not significantly different, $P=0.05$.

**Crop Value was calculated using \$9.27/cwt as the price, which is the average price in 2007-2009 (Farm Facts for South Carolina, No. 2-10, Feb. 17, 2010).

***Net Return was calculated using \$3135 as the total production cost (Clemson Cooperative Extension Watermelon Enterprise Budget, 2008-2009).

Project Title: Provide Incentive Toward the Cost of GAP/GHP Audits for Packing Houses and Processors

Sub-recipient: SC Department of Agriculture

FINAL REPORT

Project Summary:

The purpose of this grant was to increase the number of produce firms that have been through the Good Agricultural Practices (GAP) and the Good Handling Practices (GHP) programs. Twenty GAP/GHP audits were performed this past season. Food safety was improved as more farms growing and handling fresh produce participated in the audit program.

Project Approach:

\$6000 was allocated to offset the cost of the GAP/GHP audits that many of the small farmers in our state have to pay for themselves, and cannot afford to do so. Up to \$400 per farmer or firm was allowed to help defray the cost of conducting a first time GAP/GHP audit at each firm. The GAP/GHP programs are developed by the FDA/USDA and the inspections are carried out by SCDA trained personnel.

To carry out the work plan, firms were contacted and made aware of the available funding to help cover their costs. Grading and Inspection personnel set up appointments, traveled to the site, and conducted the audit. The audits were conducted from March to November 2010 so that they could be performed during the growing season.

Goals and Outcomes Achieved:

Fifteen additional firms within SC received their GAP/GHP certification by using the financial help that this grant provided.

Beneficiaries:

The main benefactors of this project are the fifteen farmers who are now GAP/GHP certified. This certification is a necessary tool for them to establish new markets for their specialty crops in today's area of food safety concerns. Additionally, the new opportunities for these growers will bring many rural areas of our state more economic vitality, as each firm becomes more stable in the marketplace.

Lessons Learned:

The "Farm to School" program was a catalyst for many of the small farmers across SC to participate in this audit process. It is anticipated to have as many as 40-50 more farmers become interested in receiving GAP/GHP certification in the 2011 growing season. Currently, the SCDA SCBGP monies help offset each audit by \$400.00 per grower. As input costs increase, a budget of \$600.00 per farmer should be a consideration in future grant writing endeavors.

Another idea to consider would be to add monies to offer to producers for water testing from a third party inspector.

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Project Title: Fresh Produce Safety Training in Good Agricultural Practices

Sub-Recipient: Clemson University

FINAL REPORT

Project Summary:

To provide training in Good Agricultural Practices (GAPs) for South Carolina Extension agents, other agriculture professionals and farmer-educators who in turn will be able to train producers of vegetables and other specialty food crops in proper fresh produce food safety production and handling practices appropriate for GAP certification.

Project Approach:

Training for this project was organized as a series of four, two-day workshops held in Columbia, Clemson and Charleston (June – September, 2010) and Anderson (February 2011). A total of 82 participants attended the training events including Extension agents and specialists working agriculture and natural resources, rural and community development, and food safety and nutrition. Other participants included representatives from the South Carolina and Georgia Departments of Education, institutional food service providers, produce distributors, and farmers interested in selling produce to local schools and institutions. Training locations, dates and numbers of participants are provided below:

- June 1-2; Columbia (Clarion Hotel and Conference Center); 14 participants
- July 12-14; Clemson University; 22 participants
- September 21-22; Charleston (Coastal Research & Education Center); 28 participants
- February 15-26; Anderson (County Extension Office); 18 participants

The training format at each location involved classroom instruction during day 1 on topics including Field Practices, Worker Health and Hygiene, Animals and Biosolids, Packing Facility Sanitation, Managing Liability and Risk, Water Quality and Product Transportation and Traceback. Dr. Lynn Turner, Emeritus Professor of Food Science at North Carolina State University, was the instructor for the classroom portion of the training. On day 2 participants travelled to a local farm for a mock GAP audit based on the USDA GAP Audit Verification Checklist. Mr. Jack Dantzler with SCDA conducted the audit to review field, packing and worker sanitation facilities at each farm. Thus participants were able to become familiar with an actual farm audit procedure and with potential issues that may affect certification. Individuals participating in the training gained an understanding of GAP requirements and procedures for USDA GAP certification. All participants received a certificate indicating that they had completed the GAP training course.

Goals and Outcomes Achieved:

The goal to having more trained personnel who can provide assistance to producers of specialty crops in the areas of food safety requirements was met. The expectation was to train at least 60 country agents and other agricultural professionals in this project. More than 20% more than the original number of students that were estimated attended the workshops.

Beneficiaries:

The producers who will receive training from the attendees, and be prepared for the GAP audit, when they are prepared for it.

Lessons Learned:

As food safety laws become more eminent, more training courses of this nature are going to be needed so that specialty crop producers can and will remain competitive in the marketplace.

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Project Title: Freewoods Farm Veggie Fest

Sub-Recipient: Freewoods Farm

Project Summary:

The Freewoods Farm foundation is a non-profit living farm museum dedicated to the mission of highlighting the role of farming in African American history. The Veggie Fest Programs were held on June 26, July 3, and July 10, 2010 at Freewoods Farm in Myrtle Beach.

Project Approach:

Each Saturday scheduled for the event, a crowd of approximately 150 visitors came to the farm to learn more about growing, preparing and consuming more vegetables in their daily diets. The classes were informative and well taught. Local instructors from Clemson University Extension Service, and the Coastal Carolina University Health Promotion Program provided valuable and timely information on the health benefits related to increasing the number of vegetables in your diet.

Goals and Outcomes Achieved:

In addition to the information that was shared in the classes, those in attendance were able to enjoy a meal made of locally grown Certified SC produce. We also had many local producers on hand to sell their vegetables in a market setting. Serving an all locally sourced meal, and having some producers on site selling, helped the attendees realize how easy it is to incorporate locally grown fruits and vegetables into their daily diet.

Beneficiaries:

Everyone involved in the Veggie Fest benefitted from the project. The attendees walked away more knowledgeable, the producers were able to be identified and become part of the local food community, as well as promote their products.

Lessons Learned:

Our one shortcoming was that we did not have sufficient information on available programs that provide financial assistance to the public in purchasing fruits and vegetables, i.e., SNAPs and WIC.

Another unforeseeable problem was the loss of additional acres that had been planted by local farmers, who were anticipating a big market at Veggie Fest, to a larger than normal deer population in Horry County. This required the festival organizers to reach out to additional nearby farmers at festival time. By so doing, we were able to meet the needs of those visitors who came ready to purchase fresh, locally grown vegetables. We are currently seeking ways to reduce the deer population in the area.

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Project Title: Provide Marketing and Food Safety Workshops for Growers

Sub-Recipient: SC Fruit, Vegetable and Specialty Crop Association

FINAL REPORT

Project Summary:

The goal of this project was to educate minority growers of specialty crops on ways to improve their direct marketing plan, keep them informed on the latest food safety requirements, and to provide information on GAP procedures and what it takes to obtain certification.

Growers needed to be made aware of these issues so they can remain competitive in the marketplace.

Project Approach:

Food Safety and Marketing Workshops were held on the following dates, with number of participants:

- | | |
|----------------------------|--------------------|
| ○ Columbia, 43 attendees | April 28, 2010 |
| ○ Sumter, 12 attendees | September 30, 2010 |
| ○ Marlboro, 29 attendees | October 27, 2010 |
| ○ Anderson, 33 attendees | January 11, 2010 |
| ○ Charleston, 25 attendees | October 19, 2010 |
| ○ Clarendon, 150 attendees | October 28, 2010 |
| ○ Cayce, 60 attendees | February 17, 2011 |
| ○ Charleston, 37 attendees | March 10, 2011 |
| ○ Kingstree, 55 people | April 15, 2011 |

TOTAL ATTENDEES: 444 SPECIALTY CROP PRODUCERS

Each workshop covered marketing techniques for direct markets for fresh fruits and vegetables, as well as food safety protocols that need to be followed to sell to the public customers at the community based markets.

The overall goal the Project Leader was trying to impress upon the attendees is how to attract customers to your booth within a community based market, and how to retain that customer from week to week visits.

There was much discussion at each meeting about taking advantage of the fresh market and the higher income potential available, the pros/cons of wholesale and retail outlets, and how the SCDA can help by providing additional marketing opportunities and materials.

Goals and Outcomes Achieved:

The total number of growers participating in the Food Safety Education and Marketing Workshops were 291. Out of this number, 135 were minority growers. Therefore, 46% of the workshop participants were minority, thus demonstrating that the special emphasis placed on recruiting minorities to the meeting was fruitful, and lead to having more minority participants that anticipated.

Ninety five (95%) percent of the growers showed an increase in their knowledge base about Food Safety after the workshops. Many of the growers indicated that they will adapt some of the recommended practices learned during the workshops.

Beneficiaries:

The majority of attendees of these meetings were minority producers of specialty crops, namely collards, sweet corn, sweet potatoes, watermelons, cantaloupe, and tomatoes. The meetings are successful, and well attended as the Project Manager provides the attendees with food safety recommendations/guidelines that they would not have gotten otherwise. Many of the farmers are from an older population; 50% are computer illiterate.

There was no formal instrument used to measure the effectiveness of the long term implications of these workshops, but based on conversations with growers, and community based farmers market managers, numerous attendees have been adapting their operations and sales techniques to what they learned in the sessions.

More attendees participated than was originally projected by the Project Manager.

Lessons Learned:

With the higher than anticipated enrollment, the workshops are obviously providing a service and information that specialty crop producers are listening to. The primary lessons learned during this grant cycle is that a mechanism must be developed and put into place that will allow the Project Manager to make assessments of these smaller farmers and how the newly learned information has helped them.

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Project Title: Implement a Training Program to Assist Farmers Market Managers

Sub-Recipient: SC Association of Farmers Markets

FINAL REPORT

Project Summary:

The majority of community based farmers markets in SC have been operated by untrained volunteers on a part-time basis resulting generally in poor management and planning. These markets do not have long term goals for sustainability, or plans to address future financial needs. The managers need to have the skills and knowledge to recruit and retain local growers of specialty crops. Long term partnerships are needed to enhance market growth and enable the managers to plan for adequately growing business plans/goals.

This project has provided training for Community Based Farmers Market Managers to improve these needed skills and educate the managers on relevant issues that will keep the markets viable and competitive. The SCDA ensured that the project solely enhanced specialty crops by approving all training material for distribution. The training materials and presentations just focused on specialty crops, and only specialty crops were used in the examples.

The SCDA and the Project Manager, will ensure that this project solely enhances specialty crops by preparing training materials and making presentations on fruits and vegetables only. In SC, during the growing season when the farmers markets are operational, it is typical to have less than 10% of the vendors at the market to have products that are not specialty crops. We have very limited access to non-commercially raised chickens, eggs, fish, pork and beef. At the larger markets in the State that pull in a higher number of consumers, only one vendor sells protein. Also, you will typically find a honey producer at these markets as well. We have one bakery in the state that participates in the larger markets.

South Carolinians perceive the farmers markets in our State as an outlet for the purchase of fresh, locally grown fruits and vegetables. The majority of our markets are only open during the peak produce season, from April to September. Our community farmers markets are true to name. As a result, the primary, and sometimes only, items sold are specialty crops in the form of fresh fruits and vegetables. As a result, all training manuals, marketing and promotional ideas, and general discussions are focused on selling fresh fruits and vegetables to the public.

The South Carolina Association of Farmers Markets will assist in supporting these opportunities by providing funds to cover the portion of expenses related to the goals cited above to offset any benefit of these activities as they relate to non-specialty food crops.

Project Approach:

We conducted two training workshops for market managers at the SC State Farmers Market in Columbia, SC in 2010. The costs of the workshops were kept at a minimum by using local speakers.

On January 28, 2010, the workshop for market managers had objectives of the workshop on two critical areas: Managing and promoting the farmers market, and Grant writing. The workshop began at 9:30 and ended at 3:30 pm. Forty eight (48) people were in attendance; 34 market managers and 14 market organizers.

On November 16, 2010, the workshop was conducted for market managers and farmers with the objectives being the management details of closing down the market for the season, and planning for the next market year. There were 53 people in attendance. Thirty three (33) market managers and the remaining were specialty crop producers. The workshop began at 9:30 am and ended at 3:30 pm.

The February 2011 Market Managers Meeting was a two day workshop held at the State Farmers Market in Columbia. There were 43 people in attendance. The workshops began at 9:30am and ended at 4:00 pm. The focus of these workshops were recruiting and retaining farmers, the WIC and SNAP programs, the Certified SC Grown program, food safety concerns, and promoting the markets within the communities.

On November 9, 2011 another Market Managers Meeting was hosted at the SC Farmers Market, from 9:00am to 4:00pm. 58 persons attended. The primary focus of this meeting was promotional ideas for SC grown fresh fruits and vegetables. The winners of the “Promotions that Sell” contest was announced, and each category winner showed pictures of their booths at the markets during the summer season. The contest was limited to vendors who only sell specialty crops. This session was well-received, as it gave recognition to the farmers who had adopted their knowledge and improved their marketing skills by attending the Marketing and Food Safety Workshops that are held by the SC Fruit, Vegetable and Specialty Crop Association. Their presentations demonstrated the inter-related activities of the farmers and the market managers, and how each group is improving itself as a result of the funding by the SCBGP.

Goals and Outcomes Achieved:

Surveys and feedback forms collected at each of these meetings are currently being evaluated by an independent researcher who is associated with Francis Marion University. These findings will be an amendment to this report in the SC State Plan Final Report.

Beneficiaries:

The beneficiaries are the families who shop at the community based farmers markets. The number of markets authorized to use WIC and SNAP benefits continues to increase. In 2011, three more markets were authorized to accept the vouchers from these programs. The market managers have been better able to coordinate farmers who sell at the markets. With the better coordination and management skills in place, a more reasonable supply of fresh fruits and vegetables are available throughout the entire growing season, which ultimately is helping the nutritionally at-risk members of the population in the rural areas of SC.

Lessons Learned:

In the future, workshops need to be located in the regions where the markets are located. This means that the workshops will be held in multiple locations throughout the state. Also, in the future, more emphasis will be placed on the markets to sign up to receive the WIC and SNAP program vouchers.

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Executive Summary
Workshop for Farmers' Market Managers
November 9, 2011

Attendees of the November 9, 2011 workshop for managers of South Carolina farmers' markets completed a questionnaire asking for their reactions to three sessions and to the workshop as a whole. Their responses to the questions, as well as their spontaneous comments, provide strong evidence that the workshop was well received and appreciated. Evaluations for all three sessions were positive, with two of the three sessions receiving entirely affirmative assessments.

Participants were unanimous in indicating that all three sessions, as well as the workshop as a whole, succeeded in engaging and sustaining their interest. For both the session on Food Safety Issues and the afternoon Panel Discussion, all 14 respondents were universally positive in their choices. In fact, for the former, a majority responded with "Strongly Agree" for each question asked. Responses for the session on Marketing Techniques for Retail Channels were also clearly positive, with only a single dissenter on four of the five questions. Their responses to questions related to the workshop as a whole were also strongly positive, as a majority chose "Strongly Agree" for each item, with no dissenters. As a result, there is strong evidence that the managers found the ideas presented to be interesting, useful in how they might improve their respective markets, and able to be implemented in a cost-effective way.

Comments offered by attendees were also positive in tone. In addition to favorable comments on workshop organization, facilities, and food, two suggestions were made regarding possible future sessions. It was suggested that: (1) the SCAFM website could be used to disseminate information in advance of such sessions; and (2) discussion of issues related to vendor complaints and disputes among vendors may be helpful.

Summary Report

Workshop for Farmers' Market Managers

November 9, 2011

This report summarizes the reactions of the 14 of 24 participants who responded to the questionnaire about their reactions to three sessions and to the workshop as a whole. The three sessions were: (1) Food Safety Issues; (2) Marketing Techniques for Retail Channels; and (3) the Panel Discussion. While it is always preferable to have a more complete set of responses, a 58% return rate is respectable and provides a sufficient basis from which to draw conclusions.

The report discusses each session separately, then the workshop as a whole, and culminates with useful information for future sessions drawn from participants' comments. Each section provides graphs depicting responses to the pertinent questions, along with overview statements to put those responses into context. The report's Appendix is presented in two parts. The first section contains those same graphs, along with tables that provide the same information, together with percentages of the 14 respondents who chose each response. The second section reports the comments offered by the workshop participants.

The Appendix also provides a detailed discussion of the method used to convert the responses to numerical values in order to aid in the analysis. In short, the technique converts the statements to a 4-point scale to reflect the extent to which participants are in agreement with the questions posed. Thus, a combined average of "4" would indicate that everyone had responded "Strongly Agree" to a question. Conversely, a combined average of "1" would indicate that everyone had responded "Strongly Disagree." As all questions were presented in affirmative terms, higher average scores indicate more positive levels of response.

Session: Food Safety Issues

Questions 1, 2, and 3 elicited participants' reactions to the session pertaining to Food Safety:

The session on Food Safety Issues . . .

1. held my interest.
2. addressed issues that are relevant for our market.
3. provided information that our market would be able to use.

As reflected in the graphic representations of participants' responses, their reactions were universally positive. For two of the three questions (numbers 1 and 3), a clear majority chose to answer

Project Title: Expansion of activities at fruit and vegetable industry events to facilitate marketing efforts of South Carolina Specialty Crops

Sub-Recipient: SC Department of Agriculture, Marketing Division

FINAL REPORT

Project Summary:

The opportunity for Trade Show participation with key retail, wholesale, foodservice distributors and specialty crop growers has positively impacted our fruit and vegetable sales position. Exposure at major trade show events previously identified translated into the following:

- Increased exposure
- Increased distributions by growers
- Increased distribution of new products
- Increased distribution of new varieties
- Increased request for growth of new crops
- Requests for additional merchandising material to enhance sales
- Requests for grower visits by retailer, and wholesale management
- Deeper relationships with retail, wholesale, foodservice buyers, due to frequency of contact at these Trade Events.

The 2009, 2010, and 2011 Trade Shows were the major target vehicles for participation. The newest show, the Eastern Produce Council/Produce Magazine, i.e. the “New York Show” provided many more opportunities for the Northeast Market penetration. Specific data will be referenced in later parts of this report.

Overall, utilization of this vehicle for exposure to fruit and vegetables grown in SC has provided a base increase of approximately 15-20% within the target categories. Numbers substantiated via interviews with produce executives within segments.

Project Approach:

The SCDA displayed within a 20x40 footprint average six major grower categories for '09 and '10. Our booth size increased to a 20x50 at PMA for 2011 which turned out to be a record show sold out in Atlanta. This allowed two more growers to participate. Our “Certified South Carolina Grown” integrated with grower spaces also promoting the “local grown” approach was the key focus. Pre-project approaches included all forms of contact with key buyers for booth visitation requests. Mailers, phone contact, viral approaches, as well as industry associates networking for attendees commitment for booth visits.

The funds used towards these booths are solely promoting specialty crops, as all grower participants are specialty crop producers. The companies within the SCDA pavilion are: WP Rawl (collards, kale, cilantro, value added fresh products, squash, zucchini, green onions), SC Peach Council, Richter and Company (peaches, bell peppers, broccoli, onions), Williams Farms (field grown tomatoes), Chappell Farms (peaches), Palmetto Sweets (onions), Coosaw Farms (blueberries, watermelons, Asian greens) and the SCDA. Other growers who attend on behalf of their companies and the State include Watsonia (organic peaches, strawberries, squash, eggplant, zucchini, onions), McLeod Farms (peaches,

strawberries, watermelon, sweet corn), and Clayton Rawl Farms (cabbage, collards, eggplant, strawberries, kale). Each participant solely produces specialty crops.

Goals and Outcomes Achieved:

The overall goal expected by show participation is to increase points of contact of all possible points of produce and fruit distribution.

Present marketing programs, packaging concepts, traceability support, good agricultural practices, as well as idea exchange with key decision makers, that fosters a cooperative unified effort for category growth.

All levels of the produce supply chain were reached through these varied shows and marketing strategies. The wholesale events include the Produce Marketing Association Fresh Summit. Retail managers and buyers are always present at the Southeast Produce Council Southern Exposure Trade Show, the Eastern Produce Council and the New York Produce Show. Foodservice and farm to school efforts are capitalized at the SYSCO, US Foods and IHF shows, which are held in different locations throughout the state. The project manager commits to reviewing the attendee list for each show, prior to registering to be involved.

<u>Industry Event/Trade Show</u>	<u>Years Participated</u>	<u>Total Average Attendance</u>
Southeast Produce Council	09,10,11	6,367
Eastern Produce Council	09,10,11	1,200
Produce Marketing Association	09,10,11	95,000
New York Produce Show	10,11	12,000
SYSCO Corporation/Local Trade Shows	09,10,11	12,500
US Foodservice/Local Trade Shows	09,10,11	12,000
Institutional Food House	09,10,11	6,000

GOAL to exposure was 120,500. Attained 145,067 in average show attendance.

Including all of the shows, and the contacts made by each company involved, the Department developed more than 200 solid sales leads through these projects. New avenues for sales, that have developed into contracts for our state specialty crop producers include Harris Teeter, Wal-Mart (domestic and international), Sobey's, Paula Deen Foods, H-E-B Mexico, United Supermarkets, and Rouse's Supermarkets. Contracts with the Military Produce Group, Commissary Purchasing Division, have also been attributed to contacts made at these large shows.

Each producer from SC who has been involved in at least one of these large, major food shows, has had more than a 10% increase in sales derived from the show. If possible from a budgetary view, the SC pavilion would be larger. Last year, because of the success and increase in sales for the participating companies, a wait list was generated.

Beneficiaries:

The beneficiaries of this project are primarily the owner/growers/producers of specialty crops who attend the show and experience of the following :

- Increased penetration of their SC Grown fruit and vegetables in markets
- Experience, i.e. growers capabilities (volume), quality food safety measures, merchandising programs, traceability technologies that their company has and can provide to the consumer
- Buyer/Seller relationship becomes enhanced and works toward common goals/objectives for fruits and vegetables
- Image consistency in trade shows has a brand building benefit
- Provides more opportunity for small and large farmers on a pro-rated basis with the fruit and vegetable category – all can participate.

The number of people who directly benefitted from the show are the immediate persons involved in the companies that were represented; approximately 50. However, when you extrapolate the knowledge that each company employees more than an average of 200 persons each, the numbers of those benefitting reach into the thousands.

Lessons Learned:

Always be in concert with associates towards a central objective for show and pre-show.

Communication is a must.

Preparation for show execution is a bare minimum standard. Know customer base and responsibilities.

Contact Information:

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Retail Merchandiser

SCDA

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Project Title: Production of Point of Purchase Materials for use at Industry Events, for Retail Promotion, for use at Local Farmers Markets, and Roadside Markets
Sub-Recipient: SC Department of Agriculture, Marketing Division

FINAL REPORT

Project Summary:

The project was successful in that it has provided funding to print point of purchase materials and signage to promote fresh fruits and vegetables grown in the state. The materials were designed to expand sales by creating visibility for locally grown produce.

The materials that have been developed for the specialty crop growers to use at the local farmers markets and roadside markets are Price Cards, Photo Brand Signs, Channel Strips, Window Signs, Bookmarks, Bumper Stickers, Harvest Finders, Pens, Pencils, Ceiling Dangers, Aisle Signs, Shelf Dangers and Seasonal Recipe Brochures.

Consumer research conducted by the SC Department of Agriculture in 2007 showed that consumers were interested in identifying where their produce originated. A strong preference of over 90% of respondents preferred local products over products sourced from other regions. The problem was identified that consumers could not easily identify local products in the marketplace. 78% indicated that identification proved to be difficult. Of the survey response, 83% indicated that they would shop at venues that identified local products.

This issue was addressed by the developing the 'Certified SC Grown' brand to identify locally grown produce items. The program was executed through the production of point of purchase materials and signage to promote fresh fruits and vegetables grown in the state. The efforts in developing the signage was augmented by producers who use the Certified SC Grown logo on PLU type labels on products as well as on packaging. Price cards, shelf talkers, channel strips and harvest guides were distributed to promote what is available throughout the year to assist in the customer recognition of the products. Consumers were encouraged to 'Buy SC Grown' and the signage provided helps them make informed purchasing decisions.

In addition, consumers wanted to support local producers when possible when dining out at local restaurants. To address this issues, the "Fresh on the Menu" campaign was created to compliment the "Certified SC Grown" program. Materials and kits were created for use by participating restarurants that showcased the restaurant as a participant and provided the framework for us to reach consumers at the food service level. Restaurants included South Carolina fruits and vegetables in menu selections and the logo was used in the menu to again inform the consumer and help them "connect the dots" and urge them to select menu items that used locally grown specialty crops.

Project Approach:

The Project Manager worked with a public relations firm to develop the promotional materials, bid them for print, and then provided them to the industry by mail or direct delivery. Staff members of the SCDA monitored the use of the materials as they travelled throughout the state, reminding store personnel that the signage may only be used to promote specialty crops.

Goals and Outcomes Achieved:

All materials, once produced, were distributed. Creating the materials for use in the marketplace, and having the materials displayed in an effort to increase sales were the goals.

A post season survey of all participating retail stores, roadside markets and community based markets showed strong support for the program. Retailers indicate that consumers noticed signage that was placed in over 500 stores statewide and that sales and sourcing of local produce increased significantly during the season. Many indicated that they created displays of local products during feature sales and that sales went up considerably. The survey showed similar increases in sales at roadside markets and community based markets. While unable to get the actual dollar sales, we were able to determine that sales of local produce increased by at least 20% over prior year sales for venues that incorporated the signage into their merchandising efforts. Some reported sales increases of local items as high as 100% for the total produce season. Growers selling at local markets stated that using the logo on price cards brought them business, as consumers would actually seek them out over others at the market that did not identify the sources of their produce. Roadside market operators reported tremendous input from local shoppers when they used the signage provided by the SCDA. Also, participating restaurants indicated that they expanded the sales of locally grown specialty crops by identifying the produce on the menu as such. The local food service purveyors bought into the effort and produced SC Sales Sheets showcasing local specialty crops items on a weekly basis.

The Survey Questions included:

5. Did the use of the Certified SC Grown brand in merchandising efforts result in the increased sales of locally produced specialty crops?
6. Will you share the projected increase in sales either in dollar amounts or a percentage increase?
7. Did the consumers mention that they had seen the logo in other marketing/media efforts conducted to encourage them to support local producers of fruits and vegetables?
8. Did you receive any feedback on how to improve the overall effectiveness of the provided materials?
9. Any overall comments or special use of the logo or signage that you would like to share?

The survey was conducted by staff members who work directly with those that received the materials.

Beneficiaries

The owners of the roadside markets benefit, as they have increased the customer awareness that they are selling local fruits and vegetables, thus increasing sales. Ultimately, the producers of these specialty crops are the ones who benefit the most, and the demand for their products increase.

Lessons Learned:

In the future, projects of this nature will be more closely monitored. It is difficult to obtain how many sales were increased by the signage. A survey needs to be developed that is specific in its wording and geared to finding answers other than “sales were higher”. Many of the market owners do not keep accurate sales records, as larger chain retailers do, where everything is sold under an assigned code.

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Project Title: Advertising Strategies to Increase Consumer Traffic at Plant and Flower Shows
Sub-Recipient: SC Department of Agriculture, Marketing Division

FINAL REPORT

Project Summary:

The South Carolina Department of Agriculture (SCDA) hosted six Plant and Flower festivals in 2010. Three Spring Festivals: Southern Plant & Flower festival April 8 – 11 at the Florence (Pee Dee) farmers market; Midlands Plant & Flower Festival April 15 – 18 at the Columbia farmers market; Piedmont Plant & Flower Festival April 29 – May 2 at the Greenville farmers market.

The Three Fall Festivals were: Autumn Fest at the Market September 24 - 26 at the Greenville farmers market; Pee Dee Fall Plant and Flower festival October 1 – 3 at the Florence (Pee Dee) farmers market; Midland's Fall Plant and Flower Festival October 8 – 10 at the NEW South Carolina State farmers market in West Columbia. \$50,000 was spent on the six 2010 Flower Festival for advertising in printed publications, radio, TV and news programs and LIVE show remotes. In 2010 the Festivals provided 330 vendors the opportunity to gain visibility and to make direct product sales to 150,000 consumers.

- Southern Plant & Flower festival April 8 – 11, 2010
 - Spent on Advertising: \$8367
 - Number of temporary vendors: 73
 - Attendance: 35000
- Midlands Plant & Flower Festival April 15 – 18, 2010
 - Spent on Advertising: \$17967
 - Number of temporary vendors: 94
 - Attendance: 45000
- Piedmont Plant & Flower Festival April 29 – May 2, 2010
 - Spent on Advertising: \$1117
 - Number of temporary vendors: 31
 - Attendance: 18000
- Autumn Fest at the Market September 24 - 26, 2010
 - Spent on Advertising: \$1117
 - Number of temporary vendors: 26
 - Attendance: 12000

- Pee Dee Fall Plant and Flower festival October 1 – 3, 2010
 - Spent on Advertising: \$6819
 - Number of temporary vendors: 48
 - Attendance: 16000
- Midland's Fall Plant and Flower Festival October 8 – 10, 2010
 - ****** First fall Festival & new location for Midlands farmers market**
 - Spent on Advertising: \$14613
 - Number of temporary vendors: 58
 - Attendance: 22000

Project Approach:

Two months prior to the Plant and Flower Festivals, 500 applications are sent to a mailing list of interested plant and flower festival vendors throughout the state. Vendors may apply to one or all three festivals. Vendors are selected by product type (horticulture and nursery crops) and by availability of space. They are sent confirmation letters and they arrive the day before the festivals to set up in their assigned spaces. Festivals are open for 4 days in the spring and 3 days in the fall with 10 hour days (except Sunday for 5 – 6 hours) the vendors sell their horticultural products that are grown in our State to the over 150,000 flower festival attendees. The first flower festival, directed by the SCDA, was held in Florence 25 years ago. With the popularity of the festivals, the SCDA added two more locations to the spring and fall line-up, at the SCDA other two State run farmers markets in Columbia and Greenville. The first fall flower show in the Midlands was held in 2010. The market had moved to a new location in West Columbia. We were uncertain about the attendance for this new venture but both the vendors and the SCDA were thrilled with the result of the advertising that generated over 22,000 buyers to the event.

Goals and Outcomes Achieved:

The Festivals in 2010 provided 330 vendors the opportunity to gain visibility, exhibit their horticulture and value added specialty crop products and to make direct product sales to some 150,000 consumers. Each year our success is obvious with increasing numbers of vendors applying for booth space and the fact that our spaces fill up before the deadline. With each festival we are promoting South Carolina grown products. Making people understand the importance of buying local products and locally grown plants. Buy South Carolina, Nothing's Fresher, Nothing's finer.

Beneficiaries:

The 330 Horticulture vendors, 150,000 consumers, and the State of South Carolina are each benefactors from this project. Buying local plants and produce increases the economy of the state.

Lessons Learned:

The SCDA Plant and Flower festivals gives the whole State a boost by helping our small plant and flower producers and value added products a place to promote and sell their locally grown plants as well as providing a one-stop shopping spot to home owners and business owners to find local plants and products, All plant material are registered with the department of plant industry.

Contact Person:

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Project Title: Small Grant Program to Assist Community Based Farmers Markets

Sub-Recipient: SC Department of Agriculture/SC Association of Farmers Markets

FINAL REPORT

Project Summary:

Together, the SCDA and the SC Association of Farmers Markets have developed a small grant program that is designed to assist small community based markets in the state, who have little resources to advertise and promote their markets. The SCDA set up an application process that required the funds being used towards the marketing of the local farmers market can only be used to promote more sales of specialty crops. Specialty crops were defined in the application and in the agreement that is signed by the SCDA and the entity receiving the funds.

The intent of this project was to create more attractive signage, banners, and brochures to encourage customers to visit the farmers market. The farmers market is an opportunity for the community to access local food, farm-direct options for farmers, and an opportunity for people to meet and socialize. Additionally, the markets promote a balanced nutritious diet by providing better access to specialty crop fresh fruits and vegetables. A recent study titled “Childhood Obesity Baseline” by Furman University, cited that based on a statistical sampling of SC students in public schools, in some areas of the state, 41% of students are overweight or obese. Therefore, it is imperative for us to provide these mini-grants to the farmers markets, so that the managers can help the farmers promote knowledge, purchase and consumption of local specialty crop fruits and vegetables for the health of our children and adults.

Project Approach:

The regular agricultural media outlets were provided an announcement about the mini-grant and an email was sent to every market manager of record in January 2010 to inform them about the mini-grant. Announcements were made about the available mini-grants at all farmers workshops in 2010. The application was titled “Community Based Farmers Markets Specialty Crops Small Grant Program”. It was clear that all monies had to be tied to the promotion and marketing of specialty crop fruits and vegetables, sold at that particular farmers market.

In 2010, the managers of fourteen community based farmers markets applied for the \$1000.00 mini-grants and all mini-grant applications were approved. An award letter was then sent to each market

manager with instructions on how to complete the grant transaction. However, one market never completed all the paperwork required. The manager of this market was informed in October that the marketing season was over and that the funds would be carried forward to 2011, when they can re-apply. Therefore, thirteen markets were awarded a mini-grant.

During the summer of 2010, market visits were made by the project coordinator, and it is noted that less than 10% of the vendors present were not specialty crop producers. Visits continued in the 2011 season to ensure that all monies were only spent on specialty crop produce.

At the close of the produce season in 2010, Mr. Broughton, Project Manager, performed a phone survey of the markets and found that only two of these community markets, Hartsville and Kershaw, that allows items to be sold other than specialty crops. However both markets are primarily for seasonal, locally grown fruits and vegetables. It is estimated (by farmers market managers) at both markets that 90% of sales are specialty crops. Both markets have other funds available including vendor fees. The Hartsville market puts all the fees back in the market. These fees amount to about \$7,500 per year. The Department's grant is limited to \$1,000 per year. The Kershaw market has a similar circumstance and puts about \$4,350 per year into the market and again the Department's grant is limited to \$1,000. According to Mr. Broughton's survey all of the markets either collect fees that are put into the market or the local community provides additional funds.

Goals and Outcomes Achieved:

The small grants that were made to the farmers markets have had a positive impact on the communities by raising the awareness and increasing the number of shoppers that visit the markets in communities that received the grants.

An informal survey conducted by the project manager of each of the community market managers has provided the following information:

- An increase in excess of 10% of shoppers was experienced at each market. One market (Sandhill Community Farmers Market) reported having between 900-1000 shoppers per market day. This increase was up from an average of 600 shoppers in 2010.
- More fruit and vegetable farmers are participating at these community markets. All farmers are selling out of their product within the established market hours.
- The demand for vendors accepting WIC and Senior Farmers Market Nutrition Program vouchers is overwhelming. In 2010, 200 small farmers in the State, who participate at the smaller community markets accepted Federal vouchers. In 2011, the number doubled to 400 accepting vouchers. The demand continues to increase, only half of the requests from farmers to accept these forms of payment have been approved. So far, in 2012, the project manager has hosted marketing workshops for more than 450 farmers across the state, to help them have a better understanding of the WIC, SNAP and SFMNP.
- Many vendors at the markets will not disclose the cash monies they earn at the market. They feel it is proprietary. However, the SCDA has obtained the information that just over \$800,000 was spent on specialty crops through the Federal assistance programs at the community markets last year alone.

Small grant program provided some resources for the markets to publicize the date and time and in many instances the markets were able to buy signs identifying the markets along with other promotional materials for the markets.

The markets used the grant funds to purchase signs, pop up tents, carryout bags with the market name, printed bi-lingual flyers and developed some online promotional programs.

All markets have charged stall fees to help offset some of their costs and we will encourage market managers and the market organizers to conduct annual fund raisers to secure funds to help offset costs even further throughout the year.

Another outcome that occurred, unexpectedly, was an offshoot of this program that developed called "Faith & Farming". The Project Manager met with the President of the SC Baptist Association to begin pursuing this avenue for outreach programs based from the Baptist churches in these rural and socially disadvantaged communities. The ongoing goal of "Faith & Farming" will be to bring more persons who are nutritionally at-risk to community based farmers markets in their areas. Printed materials about the markets, and the benefits of healthy eating, were provided to nine churches to promote the local markets. These nine are part of a pilot program. The SC Baptist Association has pledged to continue working with the Project Manager in the future to keep "Faith & Farming" growing, so that local farmers can increase their revenue streams, and the persons living in these rural areas will know that a market is close by where they can purchase fresh fruits and vegetables for their families. Also to note, most of the markets in these areas accept both WIC and SNAP vouchers, which increases the number of consumers who are dependent on these benefits.

The project manager would like for it to also be noted that Hub City Market in Spartanburg conducted an economic impact study of the contribution the market makes on the local community. An impact of 1.2 million was assessed for that one market alone.

Beneficiaries:

The markets benefitted from the increased number of shoppers who visited each week. Many markets also have additional farmers who are now involved. These promotions raise awareness levels of people in the community. As a result, the market managers, as well as the farmers, have made informal partnerships with local community leaders within the churches and other non profit organizations.

As the markets became more visible in the communities the citizens were able to identify the location of the markets and the days and time that the markets were opened. More people attended the markets, and the demand for locally grown fresh fruits and vegetables grew.

Market managers are trying to educate the growers on the importance of knowing the volume of sales that takes place at the markets. Farmers just refused to give specific sales information, you will have to look at the increases in the volume of produce that farmers are handling at the markets. Many of the market managers estimated that the number of shoppers at the market increased on average of 10% since they began their promotional program.

Lessons Learned:

The promotions generated by each Community Based Farmers Market needs to be targeted towards specific demographics.

Also, the emphasis of ensuring that the funds only be used for the promotion of SC grown specialty crops has to be made. There must be a clear understanding between the Project Manager and the Market Manager on this point. Agreements must be in writing, and signatures should be provided by each party stating that they understand the intent of the grant.

The last lesson learned is that it is always beneficial to explore outreach efforts with community leaders.

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Hugh E. Weathers, Commissioner

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agriculture.sc.gov

TO: Specialty Crops Sub-Grantees, Farmers Market Managers

FROM: Fred Broughton, Sub-Grant Manager *FB*
SC Department of Agriculture

DATE: May 16, 2011

SUBJECT: Reminder Related to Use of Specialty Crops Grant Funds

Please be reminded that recipients of Specialty Crops Grants Funds obtained through the SC Department of Agriculture can only use those funds to "solely enhance the competitiveness of specialty crops." Specialty crops are defined as fruits and vegetables, dried fruit, tree nuts, horticulture and nursery crops (including floriculture). These funds are provided by the USDA Agricultural Marketing Service as established by the 2008 Farm Bill, and use of these funds must meet the above mentioned criteria and adhere to the proposal presented in each application.

If you have additional questions, please contact one of those listed below:

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Executive Summary
Workshop for Farmers' Market Managers
November 9, 2011

Attendees of the November 9, 2011 workshop for managers of South Carolina farmers' markets completed a questionnaire asking for their reactions to three sessions and to the workshop as a whole. Their responses to the questions, as well as their spontaneous comments, provide strong evidence that the workshop was well received and appreciated. Evaluations for all three sessions were positive, with two of the three sessions receiving entirely affirmative assessments.

Participants were unanimous in indicating that all three sessions, as well as the workshop as a whole, succeeded in engaging and sustaining their interest. For both the session on Food Safety Issues and the afternoon Panel Discussion, all 14 respondents were universally positive in their choices. In fact, for the former, a majority responded with "Strongly Agree" for each question asked. Responses for the session on Marketing Techniques for Retail Channels were also clearly positive, with only a single dissenter on four of the five questions. Their responses to questions related to the workshop as a whole were also strongly positive, as a majority chose "Strongly Agree" for each item, with no dissenters. As a result, there is strong evidence that the managers found the ideas presented to be interesting, useful in how they might improve their respective markets, and able to be implemented in a cost-effective way.

Comments offered by attendees were also positive in tone. In addition to favorable comments on workshop organization, facilities, and food, two suggestions were made regarding possible future sessions. It was suggested that: (1) the SCAFM website could be used to disseminate information in advance of such sessions; and (2) discussion of issues related to vendor complaints and disputes among vendors may be helpful.



How Sweet it is

Low-maintenance fruit trees and shrubs add
a flavorful touch to any home landscape

BY S. CORY TANNER



LAWN &
GARDEN
SPECIAL

WITH INTEREST IN EDIBLE LANDSCAPES at an all-time high, many South Carolina homeowners are exploring the option of adding fruit trees to their home gardens. It's a smart strategy—one that can put tasty, nutritious food on the table for years to come while also adding color and variety to your surroundings—but the home gardener who rushes into planting fruit trees without first doing his homework, may bite off more than he can chew.

Many homeowners envision growing peaches, cherries, apples and pears, but those plants often require more maintenance than a home gardener can provide. A better way to get started growing fruit at home is by planting these six low-cost, low-maintenance trees and shrubs that are ideally suited to South Carolina growing conditions.

Getting started

For successful planting of an edible landscape, follow these basic guidelines:

PLANT NOW. The dormant season, November through early March, is generally the best time to plant fruits. Late spring planting can be successful, but be prepared to water often to get trees off to a healthy start.

CHOOSE IDEAL LOCATIONS. For maximum fruit production, choose a site that receives plenty of sun and features well-draining soil. Most fruit plants will tolerate partial shade, but fruit production will

suffer as a result. A soil pH between 5.8 and 6.5 is best for most fruits—acid-loving blueberries being the notable exception. Take a soil sample and a list of your desired crops to the nearest Extension Office for analysis and advice.

DIG WIDE. Dig planting holes as wide as possible—at least 3- to 4-feet wide—and about as deep as the plant container. Thoroughly mix any lime or fertilizer recommended by the soil test into the extracted soil. Set the plant so that its topmost root is slightly above the final soil grade, then backfill with the amended soil mix.

ADD WATER. Water the soil to settle it around the plant's roots, then apply a 2- to 3-inch layer of mulch to conserve moisture and prevent weeds. Keep the mulch 3 to 6 inches from the stem of the plant to prevent smothering of the trunk.

REMOVE FRUIT. Do not allow plants to fruit for the first year or two after planting. Fruit development robs energy from the young root system, so remove any small fruit that form right after flowering. This is the hardest part for most novice fruit growers, but it will ensure healthy growth and the best long-term production.

Asian persimmons



ASIAN PERSIMMONS ARE close relatives to our native species, but they grow into smaller trees and have better fruit characteristics than their American cousins, making them good additions to an edible landscape. The fruit of the best Asian persimmon varieties has few, if any, seeds and it's non-astringent, meaning you can eat it crisp—like an apple—something you should never try with a native persimmon!

Asian persimmon trees, sometimes called Kaki persimmons, typically mature to less than 20 feet tall. They have very nice ornamental qualities including bold, dark-green foliage in summer, followed by an orange-red fall color. Their tomato-sized fruit ripens to a bright orange in October and gives the plant the appearance of a “pumpkin tree,” appropriate for the fall holidays.

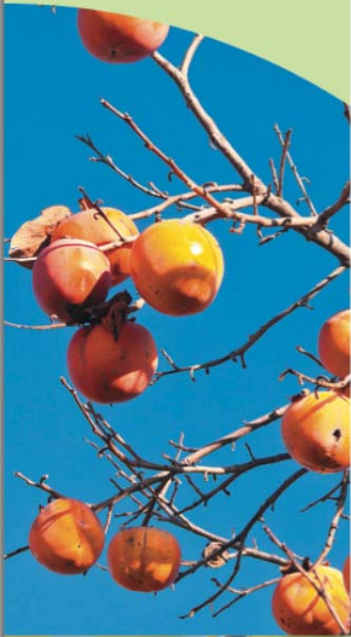
Variety selection is very important with Asian persimmons. Fuyu, Jiro and Ichikikei are all smart choices, as they produce the most-edible fruit and



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do not require pollination from a male tree. These varieties are also resistant to pests and disease, but they do require maintenance in the form of pruning and fruit thinning.

Kaki persimmon wood is brittle and the fruit is heavy, so it is important to establish a strong tree structure through early and careful pruning. Branches should be spaced 8 to 12 inches from each other along the trunk, and in years of heavy fruit set, small fruit should be removed with pruners. Leave only one fruit for every 4 to 6 inches of stem. Persimmons respond well to annual fertilization, but don't overdo it. Excessive fertilizer will cause fruit drop and may cause the trees to become more susceptible to winter cold damage.



Muscadines

PERHAPS NO OTHER FRUIT IS BETTER ADAPTED to South Carolina's climate than muscadine grapes. A cousin of table and wine grapes, muscadines are native to the Southeast and very tolerant of our heat, humidity and pests. They come in two fruit colors, bronze and black. Gardeners looking to plant muscadines can choose from many excellent fresh-eating and winemaking varieties in either color.

Muscadine vines are vigorous and will climb almost any structure they can wrap their tendrils around. This means you can train them onto a trellis, arbor, banister or fence. Since they are deciduous, they can be strategically planted to cast shadows on shade-loving perennials, or they can also be trellised on the south side of a structure to shield it from the sun.

Planting a single vine will yield fruit only if you plant a self-fruitful variety. I recommend Carlos, a versatile, self-fruitful bronze variety, and Cowart, a high-quality, self-fruitful black cultivar. Other varieties are female and will require you to plant

additional Carlos or Cowart vines to provide pollination.

Annual pruning will be the biggest challenge to this multifunctional landscape feature. To prevent the vines from becoming tangled masses of unproductive wood, you will need to remove most of the previous season's growth, back to the fruiting spurs, each winter.



Vines need to be cut back severely each winter in order to produce a new crop of grapes.

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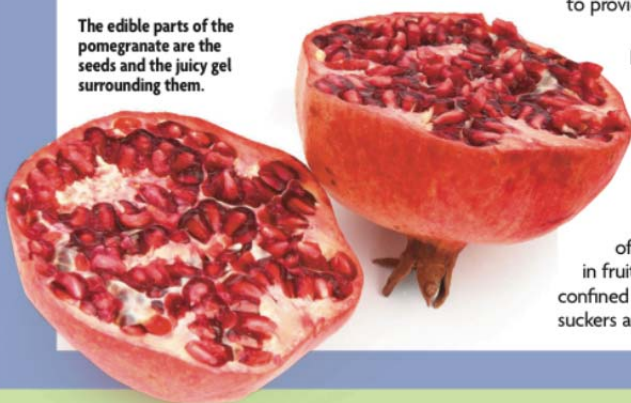
Carlos is a self-pollinating, or “self-fruitful,” bronze variety of muscadine grape.

Pomegranates

WIDELY GROWN IN SOUTH CAROLINA FOR THEIR edible fruit, pomegranates are experiencing a surge in popularity due to the health benefits associated with pomegranate juice.

Pomegranate plants are deciduous shrubs or small trees that typically grow 12 to 20 feet tall and are well-suited for use in shrub borders. They make a great backdrop for small shrubs and perennials, and you can plant them in groupings or as screens. Their stunning flowers occur over a long period from late-May until fall and attract hummingbirds. Flower color varies from scarlet-red to orange,

The edible parts of the pomegranate are the seeds and the juicy gel surrounding them.



yellow, white or variegated depending on variety. The globe-shaped fruit ripen from August to October and are generally 2 to 3 inches in diameter, maturing from green to several different shades of red, depending on the variety.

Wonderful and Granada are two common varieties that grow well and produce fruit in most parts of South Carolina. Nana is a compact variety that performs quite well in large containers. To ensure adequate fruit set, the trees will need a location with plenty of direct sunlight, and you will need to plant two or more trees close by to provide cross-pollination.

Once established, pomegranates require little maintenance. They are very drought tolerant, but if fruit production is your goal, providing even soil moisture will reduce fruit drop and splitting. Fertilizing plants in March and July with 1 pound of 10-10-10 for every 3 feet of plant height will also aid in fruiting. Pruning chores will be confined to periodically removing suckers and dead wood.

For more details on growing pomegranates, see HGIC Fact Sheet 1359 at clemson.edu/hgic.



Pawpaws

PAWPAW PLANTS ARE THE ULTIMATE low-maintenance fruit tree. In fact, these large shrubs can be found growing wild in moist, shaded woodlands throughout South Carolina. With their large leaves, pawpaws fit nicely into shrub borders and along the edges of forests, and other than annual fertilization, some minimal pruning and some extra moisture during droughts, they're practically self-sufficient. They do tend to sucker from their roots, which can be a nuisance, but the relaxed gardener can allow the suckers to grow and form small colonies.

Pawpaws exposed to enough direct sunlight will bear fruit in August when few other fresh fruit are available. The fruit, which you can eat right off the tree, resemble green potatoes and taste sort of



like banana-mango custard. Even if you don't enjoy the fruit yourself—I find that about 50 percent of people don't—birds and animals will devour them. Bonus: Pawpaw leaves are the larval food for beautiful tiger swallowtail butterflies, which will be attracted to your landscape.

When shopping for plants, look for Sunflower, PA-Golden and

Shenandoah varieties and remember that you will need to plant at least two varieties in your garden to ensure proper pollination. ☺

For more information on growing pawpaws, visit Kentucky State University's pawpaw page at pawpaw.kysu.edu.

